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ABSTRACT

Resulting from a project involving district, state, and federal educational agencies, the papers in this, the second of two volumes, are intended to provide information from research and practice that can help school districts in their efforts to make decisions about goals and methods of basic skills instruction. The topics of the papers in the volume were chosen in response to three major concerns: Should basic skills be thought of as minimum competencies? Should they be taught in isolation from each other and from the rest of the curriculum or integrated in some form? and, What can be done to help assure that an emphasis on basic skills instruction will lead to improvements in educational practice and student outcomes? Specific topics covered in the 17 papers include (1) the movement toward meaning-focused writing, (2) the writer as experimenter, (3) teaching the mechanical conventions of writing, (4) standards for effective oral communications and basic skills writing programs, (5) the application of the minimal speaking and listening skills competencies, (6) basic skills in mathematics, (7) theories and prescriptions for early reading instruction, (8) a whole-language comprehension-centered view of reading development, (9) direct reading instruction, and (10) learning to learn from text. (FL)

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2 Basic Skills Issues and Choices

Approaches to Basic Skills Instruction

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Preface

This two-volume collection is the result of cooperation among federal education programs and many researchers and practitioners recognized as experts in basic skills instruction. The papers describe choices and issues to be considered in reviewing current basic skills programs or planning for program improvements. They have been prepared on the assumption that, in planning and reviewing of basic skills programs, it is helpful to know what the choices are, what the important differences among the choices are, and how those differences will influence the outcomes of instruction in a given situation.

We believe a parallel exists between our experience in this project and the experience of many school districts in reviewing, planning, and implementing improvements in basic skills programs. Three important approaches used in preparing this collection were (1) the cooperation among programs responsible for research and programs responsible for school improvement and, more generally, among researchers and practitioners, (2) the open presentation and discussion of conflicting views, leading to a position which respects the strongest points of competing views, and (3) the continuing development and refinement of ideas based on new knowledge and experience.

We suggest that these same approaches are needed in planning at the district level. Thus, in any district there are experts in the schools and in the district office who have important knowledge to contribute to planning for basic skills instruction. Parents and other community members also have important perspectives to contribute. In addition, in most districts there are also college or university personnel who might bring essential perspectives to the process. Basic skills planning must be done in an atmosphere that encourages input from all of these people and that allows time to build understanding and consensus among participants with differing or opposing perspectives.

We commend this collection to you as a resource which we believe can be a helpful tool in the review of current basic skills instruction or planning for improvements in instruction. We invite your responses on how it is useful, or on how it might have been made more useful.

Shirley Jackson
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Acknowledgments

These papers are the result of collaboration among many educators, including educational researchers and staff of federal, state, and district educational agencies. Approximately two hundred people have been involved in the planning of the project, preparation of the papers, review of the papers, and preparation of the introduction. We want to acknowledge our appreciation to the following individuals and groups for their good ideas, hard work, and cooperative spirit.

- All of the consultants from school districts and universities who worked intensively with us in different phases of the project. These included representatives from each of the basic skills areas who met with us in July 1979; members of the planning group which met in September 1979; the educators and researchers who met to synthesize the issues and choices in late September 1979; the reviewers for each of the basic skills areas, who worked with us in February 1980; and the reviewers for the introduction.
- The more than 100 people who provided written or telephone reviews of the papers in this collection.
- People who were interviewed to help us determine the questions to be considered, including staff of appropriate House and Senate committees, members of the Department of Education's Basic Skills Coordinating Committee, staff members of the National Institute of Education, staff members in several State Departments of Education, and parents and professionals from several school districts.
- The American Federation of Teachers (AFT) and the National Education Association (NEA), for their assistance in reviewing the project plan and in identifying teachers to participate in the three-day synthesis meeting.
- Staff of the Basic Skills Improvement Program, especially Shirley Jackson, Lorraine Mercier, Helen O'Leary, and Ann Drennan. These people helped us determine the issues to be addressed, provided critiques and suggestions along the way, and were instrumental in the final preparation and publication of the papers. Our special thanks to Lorraine Mercier, Program Officer for the project, who exhibited patience and a dedication to the project above and beyond the call of duty.
- Sandy Robinson and Tom Sticht, who played crucial roles in initiating the basic skills focus of this collection of papers.
- Joann Kinney, who, as a member of the Reading and Language Studies Team of NIE's Program on Teaching and Learning, helped to keep the project responsive to concerns of other NIE staff.
- Ed Myers, Director of CEMREL's School Improvement Group, whose contributions and constructive criticism during the writing of the introduction were invaluable.
- Michael Kane, Assistant Director for Research and Educational Practice, NIE, who gave support and encouragement.

S.W./L.J.R.

Foreword

The purpose of this collection of papers is to provide information from research and practice which can help school districts in their efforts to make decisions about goals and methods of basic skills instruction.* The papers include descriptions of different approaches to instruction in each of the basic skills areas — writing, speaking and listening, mathematics, and reading — and discussions of issues to be considered in deciding on the best mix of the different approaches for a particular school or school district. Generally, the papers reflect an expanded view of the basic skills, rather than a minimum competence view.

The collection is intended to be useful to professionals involved in basic skills planning for classrooms, schools, and school districts, but we have assumed that it will also be of use to state and federal policy makers, to people involved in preservice and inservice education, and to researchers.

Often basic skills planning is done with too little time, limited involvement of professionals and community members, and in the absence of adequate information and knowledge. The papers included in this collection are intended to provide or give references to much of the knowledge relevant to reviewing and planning basic skills programs. We hope that this knowledge base will serve as a resource for school districts and will also encourage them to extend the time provided for basic skills planning and the range of involvement in that planning.

The collection grew out of the needs of the Basic Skills Improvement Program and the National Institute of Education. The Basic Skills Improvement Program staff were then responsible for coordination of basic skills activities in more than twenty federally supported programs and for facilitating coordination for basic skills improvement in states and school districts. In order to do that effectively, staff of the program felt that they needed to have a clearer understanding of the approaches and issues to be considered in basic skills planning. The National Institute of Education is responsible for support of educational research and for making knowledge resulting from research available to practitioners in useful forms. Thus, the needs of the Basic Skills Improvement Program for information meshed with the National Institute of Education's responsibility to make knowledge available in a useful form.

Over the last two years, planning and management of the project has been a cooperative venture among Basic Skills Improvement Program staff and staff members in two programs within the National Institute of Education: the Dissemination and Improvement of Practice Program and the Teaching and Learning Program. In the last year, staff of the Research and Development Interpretation Service at CEMREL, Inc., a regional educational laboratory located in St. Louis, Missouri, have become involved in

*For persons interested in more detail about this project, Spencer Ward has described the procedure used and some of the complications in "An Exploratory Study of a Consensus-Building Approach to Knowledge Synthesis and Interpretation," which will be available in 1982 in *Knowledge Structure and Use: Theory and Practice of Synthesis and Interpretation*, edited by Spencer Ward and Linda Reed and sponsored by the National Institute of Education.

the project. In addition, eighty researchers and practitioners were involved in writing papers, project planning, and analysis of issues. Another two hundred practitioners, policy makers, and researchers helped to identify questions to be addressed or provided reactions to one or more of the papers.

We have considered this to be a synthesis project. Although that term is little used in the volumes, we wanted to highlight here that aspect of the project. Educational research and development have produced much new knowledge in the past twenty years. That research has often not been helpful in improving education. One of the reasons for this failure appears to be that new knowledge is often not organized so the many pieces of knowledge relate to one another and to planning and instruction in schools.

To organize the knowledge, project staff decided to use a modification of a method used by the R&D Interpretation Service for the development of the products in its *Research Within Reach* series. Those products organize knowledge about reading and mathematics instruction around questions asked by teachers. In the present project, we chose to organize knowledge around the questions asked during interviews with thirty state, federal, and district policy makers, and with a smaller sample of parents and teachers.

The interviews were conducted during the period when the Basic Skills Improvement Program was soliciting proposals for a grants competition among local school districts and plans for basic skills coordination from the state departments of education. It was not surprising, therefore, that many of the people who were interviewed expressed concerns or fears about how the basic skills might be misinterpreted as a result of the language in the Basic Skills Improvement Act, rather than asking questions. Some of those interviewed feared that basic skills would be seen as too narrow, thus excluding many of the skills that contribute to successful — rather than just adequate — functioning in our society. Others believed that basic skills *should* be narrowly interpreted.

Based on the interview responses, three related problems were identified: first, there is widespread disagreement on the goals and methods of basic skills instruction; second, there is not a clear understanding of the different approaches to basic skills instruction, so there is no basis for thoughtful choice among different perspectives; and, finally, there exists an inaccurate perception of the basic skills legislation as emphasizing individual skills taught in isolation from other content. The interviews also revealed concerns about the relationships among the four basic skills areas and other parts of the curriculum.

After discussing the interview findings with a number of consultants, we chose to address two questions in the project: (1) What issues should be considered in planning basic skills programs? and (2) What are the choices in planning basic skills instruction? Our initial goal was to present the major issues and choices and to avoid advocating any particular approach. Our plan was to find people to prepare papers analyzing different approaches to basic skills instruction and the issues to be considered in developing a basic skills program, and then to have a group of researchers and practitioners use the papers as a resource for making sense of the various issues and choices, much as we hope school districts will do with the published document.

We wanted to present descriptions and rationales for different choices in the basic skills, representing the different opinions we heard in the interviews. We chose to have different writers prepare brief descriptions — a difficult task in itself — of what we perceived to be the three different approaches to instruction in each of the four basic skills — a subskills approach, a holistic approach, and a balanced approach (a blending of the first two). We also identified people with special interests in such areas as coordination of instruction, classroom management, assessment, and program planning and asked them to write about those issues as they related to basic skills planning and instruction.

Most of the "issues" papers worked out as planned. Several topics, however, proved to be too complicated to deal with in a short paper without being more confusing than helpful. These papers — focusing on motivation, preschool education, adult education, and bilingual

education — were removed from the collection.

The "choices" papers — and the choices themselves — proved to be far more complex than we had anticipated. Only in the area of reading were we able to find experts who would advocate quite different approaches, but it was not a clear split between a subskills approach and a holistic or meaning-focus approach. All of the papers on reading emphasized the importance of instruction in comprehension. In the areas of written communication, oral communication, and mathematics, however, we were not able to find widely respected advocates of opposing approaches. Although the authors agreed to place an emphasis on one approach or the other, they would not agree to encourage an exclusively subskills or holistic approach. Many argued that, in fact, this dichotomy did not reflect the issues in these areas of the basic skills.

The approach used involved ongoing review and revision of the papers, with each round taking into account the comments and suggestions of a variety of reviewers. In addition to this consensus-building approach to the papers, we used a strategy of identifying the most important assumptions behind opposing positions and testing them by open critique.** This second strategy involved a group of thirty-five researchers and practitioners who worked with us for three days to make sense of the choices and issues. This group was responsible, ultimately, for a major shift in our thinking about the choices that teachers have available to them as they plan basic skills instruction.

The group suggested strongly that the important question for school districts is not "Which approach is the best approach?" but "How can the teacher, school, or school district create a basic skills program that will take advantage of the strengths and avoid the weaknesses of each approach?" In other words, "How can a school create the richest mix of approaches?" We began to move away from our emphasis on choosing between a narrow (subskills) and a broader (holistic) definition of the basic skills and toward an emphasis on finding the richest mix of the two, a mix which is responsive to the needs and concerns of the students, teachers, and parents. The introduction to the two volumes reflects that shift in our thinking.

We have found this experience with collaboration to be a challenging venture and a personally and professionally rewarding one. We hope the ideas presented here will lead to further cooperation among practitioners, policy makers, and researchers at the federal, state, and district levels. This project has also impressed us with the need for a possible new direction in research on basic skills, research that looks at the ways in which educators create mixes of various approaches in order to meet the needs of individual children in a variety of situations.

Spencer Ward
National Institute of Education

Linda Reed
CEMREL, Inc.

**The consensus-building and assumptions-testing techniques used in this project were adapted from previous work done by Edward Glaser and Ian Mitroff, who consulted with us in planning the project.

Summaries of the Papers

Volume 1

Issues in Basic Skills Instruction

Linda M. Anderson. **Classroom Management: Making Time to Learn Basic Skills.** Because its purpose is to support instruction and to create an environment for learning, effective classroom management is critical to the success of any basic skills instructional program. Involving much more than discipline, classroom management includes organizing the physical environment of the classroom, scheduling and pacing activities, organizing supplies and instructional materials, and monitoring students' progress, attention, and behavior. The amount of time that students spend on learning tasks determines the usefulness of management strategies in various classroom settings.

Dorothy S. Strickland. **Integrating the Basic Skills through the Content Areas.** If the basic skills are to provide students with the means to attain the information required for successful living in modern society, then teachers and administrators must reorganize the curriculum to integrate the basic skills into a unified communications program. Such a program requires that basic skills be applied in combination with one another and that they be taught in a context that is of interest and importance to the children. This integration of skills allows instruction to take place in a holistic manner and provides for the monitoring of basic skills objectives in an organized way.

Majorie Farmer. **The Essentials of Education: Basic Skills in Context.** "The Essentials of Education" represents a joint effort by leaders in over 20 major national professional educators' associations to develop, discuss, disseminate, and implement a working definition of educational interdependence at all levels of the educational process. Some of the implications of this statement include: a definition of basic skills that includes written and oral communication; the teaching of language and reasoning in all content areas; multicultural awareness in teaching; maintaining the natural interrelationship between learning and interest; attention to the physical environment and social context of learning; and life-long learning for parents and teachers.

John L. Meehan. **State Leadership in Basic Skills.** The Pennsylvania Comprehensive Reading/Communications Art Plan (PCRP) evolved from a 1976 decision by the Pennsylvania Board of Education to define quality education in terms of basic skills. With advancing student competence in reading and oral and written communication as a goal, PCRP defined four major categories of action: responding to literature (heard, read, visualized, or dramatized); sustained silent reading; written and oral composing; and mastering language patterns (spelling, syntax, meaning). Since its inception, PCRP has been piloted in small rural districts and medium-sized, semi-rural districts, has served as an intermediate unit for 12 districts and 99 schools, and has served as a model for hundreds of schools throughout the country.

James R. MacLean. **Forward to the Basics — Ontario Style.** In an effort to involve teachers, students, and parents more actively in the inte-

gration of basic skills with other segments of the curriculum, the Province of Ontario, Canada, adopted a curriculum model composed of carefully balanced components. These components stress the individuality of the child and focus on the following: aims and objectives based on knowledge of children's and society's needs; content selected from the environment; dynamic teaching and learning processes derived from the content; and the assessment of outcomes in terms of effectiveness, appropriateness, and relevance.

Betty M. Beck. **Learning in Real-Life Contexts.** Real-problem solving classes, where students are involved in changing school or community situations that are important to them, reinforce a wide variety of mathematical and language arts inquiry skills. In these classes the students, not the teacher, choose the problem to be tackled, decide what factors need to be investigated, search out the facts, try out possible solutions, and judge the effectiveness of their results. Several assessment studies of schools that offer these classes reveal that participating students are highly motivated, interact well with their group, and display an ability to choose and apply objectively measurable reasons for their decisions and to discern effective solutions.

Thomas C. O'Brien. **What's Basic? A Constructivist View.** In a constructivist view of basic skills, the goal of education is to cause intellectual growth to take place by providing a structural framework of basic skills or operations — such as classifying, ordering, logically multiplying, and inferring — that enable the child to construct and test relationships, and from which subsequent knowledge can evolve. A classroom atmosphere based on a constructivist approach to education allows the students to develop an understanding of the relationships among environment, experience, and inference and an ability to regulate their own internal needs and perceptions within the demands of reality.

Issues in Basic Skills Outcomes and Classroom Planning and Assessment

Robert W. Stump and Nina Selz. **Basic Skills for the World of Work.** A study sponsored by the National Center for Research in Vocational Education defines the three most important abilities required for the world of work as follows: using the reading, mathematics, and writing skills the job calls for; using the tools and equipment the job calls for; and getting along with others. Results of the study suggest that the curriculum at every stage of elementary, middle, junior, and senior high school can focus on the development of these essential skills and others (described in the paper) necessary for adequate performance in the world of work. However, this task requires close cooperation and participation from school personnel, families, and employers in the preparation of children for the world of work.

Georgine Loacker and Marcia L. Mentkowski. **A Holistic View of Adult Abilities.** The faculty of a midwest college undertook a ten-year process to define and measure the knowledge and basic skills that they wished their students to acquire and to assess effective ways to measure the achievement of these goals. In addition to the practical information provided by the college curriculum, the study yielded the following implications for elementary and secondary educators: students need early involvement in the developmental education process; assessment should be diagnostic as well as evaluative; students learn better in an environment that teaches them how to learn; developing the potential of each student means that students must be treated individually; and realizing important outcomes in education requires a carefully planned educational process.

Lena Lupica. **Skills For the Future.** Rapid changes in cultural, ethnic, and language trends, in the composition of the nation's work force, and in technological leadership require a broader definition of the basic educational skills needed to survive in our society. Some skills that focus on reducing daily tension and improving the quality of life include: knowing how to cope with change; being able to anticipate alternative future developments; knowing how to learn; being able to use computer, voice, and visual equipment; having the ability to develop effective human relations; and knowing how to be an effective citizen.

Vito Perrone and Walter Haney. **Classroom**

Monitoring and Assessment. If teachers are to be able to design instruction that successfully helps children to learn the basic skills and if communication with parents is to be effective, then teachers must use consistent, well-organized informal assessment procedures in the classroom, in addition to formal procedures such as norm-referenced and criterion-referenced tests. Assessment must be done frequently, so that it can inform decisions about instruction, and it must be relevant to the instruction that has taken place.

Patricia Weiler. **Planning and Management of Instruction.** If a child-centered basic skills program is to insure continued student skill development and achievement, the responsibility for the instructional process must be shared by teachers, paraprofessionals, administrators, curriculum specialists, students, and parents. For those who make up the instructional team, responsibilities include preparing the instructional package, organizing the classroom, determining an appropriate diagnostic and evaluative process, and participating in inservice programs. Parents support the program through the use of learning games and selective television viewing at home.

Issues in Basic Skills Planning

Michael L. Kamil. **Making Choices in Basic Skills Instruction: Research and Theory.** In planning a basic skills program that is based on what the students need to learn, the collaborative planning group needs an instructional framework that includes working definitions of the words "basic" and "skills" and theoretical bases for determining units of learning, content and format of instruction, individual differences in students, and the role of social dynamics. Possible instructional models for consideration include a subskills model that focuses on the individual components of instruction, a holistic model that places instruction in a whole situation context, and a balanced model that combines specific features of the other two models.

Gerald G. Duffy. **Making Basic Skills Choices: Values and Constraints.** Some issues considered by a collaborative program planning group in designing a specific basic skills program include the following: assessing the local district's position with respect to subject matter, the learner, the teacher, and the learning environment; identifying those constraints which society, special interest groups, and school managers place upon curriculum programs; and identifying the realities of the classroom which affect the implementation of any program.

Charles E. Allen. **At the Barricades: A Cautionary Tale.** In response to a state mandate that students meet minimum requirements before graduation, one school district developed a mathematics curriculum based on the functional application of computation skills. Focused primarily on those mathematics skills needed for survival in the modern world, the materials grouped specific tasks under eight headings: banking, expenses, measurements, money, prices, taxes, wages, and whole numbers. Problems encountered in planning the materials ranged from implementation of objectives to the actual test format and word choices.

S. Jay Samuels. **Characteristics of Successful School Programs in Basic Skills.** An analysis of research studies that dealt with basic skills programs during the past fifteen years indicates that effective programs have a number of characteristics in common. These components include the following: strong administrative leadership; high expectations and the belief that the teacher can make the difference; teacher aides used in direct instruction; teacher training; specific reading objectives; instruction and materials relevant to goals; efficient use of time; high intensity of treatment; and frequent evaluation of student progress.

William Phillip Gorth and Marcy R. Perkins. **Skill Definition in State Competency Testing Programs.** Programs from five states — Georgia, Michigan, Virginia, Massachusetts, and New York — are described. These states identified and defined minimum competencies and basic skills and considered a variety of instructional approaches before developing their particular state programs. Four programs identified reading, mathematics, and oral communication as basic skills subject areas, and the fifth program also specified listening. The focus of program objectives varied from functional to academic skills. Two states combined both skills catego-

ries, but differed in the degree of emphasis placed on one or the other. Three states required a state test for promotion or graduation while two states used test results for remediation and curriculum improvement.

John R. Bormuth. **Literacy Is Rising, But So Is Demand for Literacy.** An analysis of several research studies that indicated a decline in the literacy level in the United States reveals a need for a clear definition of literacy and calls for the identification of major flaws in literacy assessment studies. In contrast, a study based on economic trends specific to literacy-related expenditures concludes the following: literacy is a major economic force in our society; a demand for higher levels of literacy exists over a broad portion of the population; and studies on literacy must first ask what norms determine whether or not a person is literate.

Volume 2

Writing

Charles Suhor. **NCTE Statement on Standards for Basic Skills Writing Programs.** Prepared with input from professional associations as well as from the staffs of several school districts and universities, "The Standards for Basic Skills Writing Programs" suggests a basically holistic approach to writing instruction that focuses on effective communication of the writer's ideas in relation to his or her purpose and audience. The practical implications of the Standards require that commercially published materials deal with the whole writing process, that classroom drills be based on student writing needs, and that inservice for teachers provide techniques for increasing student motivation, using group discussion, and teaching effective writing skills.

Robert L. Brown, Jr. **The Movement toward Meaning-Focused Writing.** Since most professional writers do not write the way that textbooks say that writing should be done, an effective approach to writing instruction requires rethinking the traditional definitions of the writing process. Such an approach focuses on the cognitive processes involved in writing and uses teaching strategies that stress the following: prewriting, drafting, revising, and editing skills; student assessment through writing conferences with the teacher or other students; and sentence-combining exercises for fluency and syntax development.

Thomas Newkirk. **The Writer as Experimenter.** A meaning-focused approach to writing instruction assumes that writing is a natural activity closely related to thought and emphasizes allowing the child to explore and experiment with ideas. Based on a process of prewriting, writing, and revision, this approach provides the student with techniques for evaluating writing, stresses the importance of reading student writing aloud, employs individual conferences rather than class presentation, and focuses on the assessment of content, thought development, and communication before that of mechanical or grammatical errors.

Vivian I. Davis. **Teaching the Mechanical Conventions of Writing.** Effective teaching of the conventions of handwriting, spelling, punctuation, capitalization, and grammar requires that these skills be taught within the context of the experiences of the individual student and the writing process as a whole. Some techniques that stress effective written communication include the following: individualized practice in handwriting; the test-study-test method for spelling focused on words needed in student writing; dictation exercises, followed by proofreading and editing in capitalization and punctuation; and grammar presented through student sentence development.

Speaking and Listening

Barbara Lieb-Brilhart. **Standards for Effective Oral Communication Programs.** While the Basic Skills legislation includes oral communication skills in its definition of "basics," several assumptions and some potential conflicts merit understanding and consideration in implementing the "Standards for Effective Oral Communication Programs," prepared by the Speech Communication Association (SCA) and the American Speech-Language-Hearing Association (ASHA) as guidelines in curriculum planning. These assumptions are that oral communication instruction is critical in teaching of the content areas, is worthy of instruction for its own sake, and should be viewed as a separate discipline. Conflicts can arise regarding such issues as the

definition of communication, academic standards, teacher qualifications, and methods of assessment.

Barbara S. Wood. **Oral Communication: Holistic Skills/Functional Approach.** One instructional approach to oral language development in children incorporates a functional view of communication centered on five critical functions of everyday interactions; attempting to direct or control the behavior of another; sharing feelings; providing ideas and information; ritualizing (greeting, thanking); and imagining, or dealing creatively with reality. These communication functions are taught through a process that stresses the development of a repertoire of communication strategies, that develops selection criteria for choosing appropriate strategies, that provides practice in implementing communication choices, and that offers methods that children can use to evaluate their communication.

Fred E. Jandt. **Oral Communication: Individual Skills Focus.** After "effective communication, both written and oral" was added to the wording of the Basic Skills Improvement Act in 1978, research specialists identified nineteen speaking and listening competencies as basic to two-person interactions, small group discussions, and public speaking. A number of states then developed minimal competencies in speaking and/or listening to be implemented on either a statewide basis or as a local option. The approaches used by five states — Vermont, Virginia, Oregon, Utah, and Massachusetts — are described here. The lists developed by these states describe competencies in a way that allows their assessment through both informal and formal means.

Clarice P. Lowe. **Application of the Minimal Speaking and Listening Competencies.** Instruction in basic communication skills can integrate both conceptual and experiential learning in a manner that facilitates the mastery of a complex grouping of skills called competencies. An approach to teaching one speech communication competency, that of "organizing messages so that others can understand them," involves activities — such as topical and chronological ordering — that progress from simple to complex levels of learning and also meet John Dewey's four criteria for meaningful experiential learning.

Mathematics

Marilyn N. Suydam. **Basic Skills in Mathematics: The Issue Regarding Computational Skills.** While the definitions of basic skills instruction in mathematics vary from teaching computation skills exclusively to presenting computation along with an expanded set of mathematics skills, factors such as the needs of daily life, tradition, achievement scores, availability of calculators, and teacher capabilities both stress the importance of computation and call for the application of mathematics skills in a broader context. However, despite evidence that drill-oriented instruction produces limited outcomes, trends indicate a return to drill as the primary mode of instruction. A need exists to define teaching methods that produce mathematical competency in children.

Ross Taylor. **The Mathematics Education Profession's View of Basic Mathematical Skills.** Three professional mathematics education organizations have agreed on ten basic mathematics skills to be taught in addition to computation. School districts that are in agreement with the statements of these organizations need to reevaluate curriculum objectives, initiate appropriate curriculum revision, and provide staff development. One school district engaged in this process used the following procedure: definition of objectives by a professional task force; parent and community evaluation of standards; administration and teacher evaluation of available standardized tests; and development of learning activities that place mathematics skills, including computation, in a context of problem solving.

Alan R. Hoffer. **A Child Is More than a Machine.** Along with memorizing, drill, and computation skills, a good mathematics program emphasizes the teaching of insight, a special human skill of seeing and understanding problems. Insight demands creativity and risk-taking on the part of the student and requires that the teacher provide appropriate learning experiences in a supportive, positive, and encouraging classroom atmosphere. Competence in insight provides the child with the ability to

perform in unfamiliar situations, choosing the acts required by the situation and eventually resolving the situation.

Reading

Lauren B. Resnick. **Theories and Prescriptions for Early Reading Instruction.** The two main strands of theory regarding the nature of reading can be defined as reading as translation and reading as an autonomous language process. Although patterns in research indicate that code-oriented programs show better results in the primary grades than do language-oriented programs, the need exists for consistent investigation and trial of the language approach before comparison of the two methods is valid. At present, successful instructional programs include both strategies successively. However, a more effective approach presents the code and language aspects of reading simultaneously.

Kenneth S. Goodman and Yetta M. Goodman. **A Whole-Language Comprehension-Centered View of Reading Development.** A whole-language comprehension-centered approach to developing reading ability requires a child-centered classroom where the focus in reading instruction is on meaning, where learning motivation is intrinsic, and where the selected reading materials appeal to the experience, concepts, and interests of the children in the classroom. Specifics of such a developmental reading program include periods of sustained silent reading, a wide selection of books, emphasis on the reading strengths of the students, and student self-evaluation as an integral part of the assessment process.

Douglas W. Carnine. **Direct Instruction: A Bottom Up Skills Approach to Elementary Reading Instruction.** Given that a child's capacity for processing information and creating meaning from the environment is limited, a subskills approach to reading instruction makes meaningful learning possible. It reduces the information load, simplifies the learning act, and allows for mastery learning. Implementing such a program in the classroom requires the following: knowledge of the essential skills or objectives that make up the reading process; program design that involves evaluation and selection of materials; presentation techniques that motivate, reinforce, and assess; effective organization of classroom time; and individualized instruction determined by frequent student evaluation.

Harry Singer. **An Integration of Instructional Approaches for Teaching Reading and Learning from Text.** Reading development consists of two distinct phases: teaching students how to read printed words and then construct meaning from them, and teaching students how to comprehend or learn from texts in the content areas. The initial phase of reading instruction involves the use of informal techniques such as reading aloud to children or discussing books with them, and formal techniques that include the picture-story method, rebus method, basal reader, and individualized instruction. In teaching students to learn from text, teachers can employ single-text strategies, like the SQ3R method, or multiple-text strategies that involve library usage, concept techniques, and projects.

Robert J. Tierney and P. David Pearson. **Learning to Learn from Text: A Framework for Improving Classroom Practice.** A schema-theoretic approach to reading comprehension considers the nature and influence of the reader's background knowledge, attempts a balance between reader-based and text-based processing, and stresses the importance of selected monitoring strategies. Effective instructional practices that evolve from this approach provide the reader with the following: a relevant schema for a text; appropriate activation of this schema prior to, during, and after reading; flexible processes of activating, focusing, maintaining, and refining an interpretation; adequate understanding of the text and purpose for the reading; and awareness of potential applications.

Penelope L. Peterson. **Direct Instruction Reconsidered.** An analysis of research on the effectiveness of "teacher-directed" versus "open" instruction indicates that the traditional approach is slightly more effective, on the average, in increasing students' achievement in basic skills. However, an open approach appears to increase students' creativity, independence, curiosity, and favorable attitudes toward school and learning. Because neither approach meets the needs of all students, educators must incorporate both teaching approaches in a workable combination, if a wide range of educational goals is to be achieved.

Writing

Overview: *Although we find little disagreement among the experts on how to teach writing, a significant difference exists between what experts agree on and what some teachers and parents believe is good instruction. The authors of the four papers on writing agree that the teaching of writing should focus on helping the student to express ideas clearly. Punctuation, grammar, and spelling are necessary for effective writing, but the evidence suggests that students learn to write best if the emphasis is on their clearly conveying ideas which are important to them. It also appears that students should be taught from the beginning to review and revise their papers, with attention being given to the mechanics of writing in the final draft after the ideas are clear. Charles Suhor's paper describes the background and implications of a set of standards for writing instruction prepared by the profession. Robert Brown, Thomas Newkirk, and Vivian Davis provide additional rationale for that position and suggest instructional strategies in their papers.*

NCTE Statement on Standards for Basic Skills Writing Programs

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Editors' Note: *Several professional associations have prepared sets of standards to help guide the planning of basic skills programs. This paper provides background on how the NCTE "Standards for Basic Skills Writing Programs" were prepared and suggests some of the major implications of the Standards for writing instruction. Part of the value of each set of standards is that they were prepared, reviewed, and revised with input from association, university, and school district staff. They generally represent the best thinking of professionals concerned with instruction in the area under consideration. The author of this paper was actively involved in the process of developing the NCTE standards for writing instruction.*

In fall of 1978 the U.S. Office of Education invited the National Council of Teachers of English (NCTE) to prepare a statement on standards for basic skills writing programs for possible inclusion with federal regulations to be sent to school districts and others applying for funds under ESEA Title II legislation. The Council had already urged Congress to include oral and written language in the new legislation (past legislation had been limited to reading and mathematics), so the NCTE Executive Committee was pleased to comply with this request. This brief paper describes how the basic skills writing program standards were prepared and offers my interpretation of some major implications of the standards.

The first step taken by the Executive Committee was to authorize an Ad Hoc Committee on Standards for Basic Skills Writing Programs. On the committee were theorists, researchers, and practitioners; university, high school, and elementary school representatives; specialists in curriculum, instruction, evaluation, and supervision and administration. Philosophically, the group included advocates of change as well as moderates. At the outset, then, there seemed to be two separate but related problems: what would be the substance of a statement on standards for basic skills writing programs, and how would a group so diverse come to agreement on such a statement?

John Maxwell, then NCTE's Deputy Executive Director for National Relations, started the process by creating an initial set of standards — something concrete yet highly tentative, he said, a set of ideas that the committee "could shoot down" in creating its own content and format. The Maxwell document was circulated by mail to the committee. Gary Tate (Texas Christian University), then director of NCTE's Commission on Composition, served as chair. Other members were Marjorie Farmer (School

District of Philadelphia), Richard Gebhardt (Findlay College, Ohio), Martha King (Ohio State University), Barbara Lieb-Brilhart (then with the Speech Communication Association), Betty Murray (Lexington Schools, Massachusetts), Lee Odell (State University of New York, Albany), and Eileen Tway (Miami University, Ohio).

Members of the group did indeed exercise their shooting privileges in preparation for a meeting in Columbus, Ohio, on January 5-7, 1979. Maxwell asked me to attend the meeting as headquarters staff representative so that he would not be tempted to defend his initial efforts in the development of the statement. The meeting was one of those fascinating, exhausting, prolonged sessions in which articulate professionals with different opinions try to find a common ground. All were mindful of the fact that the final statement could not be an overly cautious dilution of various viewpoints. The statement would have to be a lucid, straightforward set of guidelines that can be used by non-specialists — district-level federal program writers, teachers, school and community committees, and the lay public. After two days of earnest, sometimes harried discussion, the group created a near-final draft.

After the Ohio meeting, Maxwell circulated the document again, polling the entire committee on unresolved points and conferring with Gary Tate on details of language. The result seemed to be an uncommonly strong statement that presents not merely a "position" but a list of elements that are essential to good writing programs from kindergarten through the twelfth grade.

Response from the Office of Education and from the field supported this view. Shirley Jackson, then acting director of the Right to Read effort, called the statement "a skillful integration of elements of teaching writing, mechanics, and evaluation that should form the foundation of any good writing program. The nation's children will indeed profit as these insights are passed on to administrators and teachers." The document became a part of the materials sent to potential applicants for ESEA funding. From all indications so far, the standards provide clear, helpful guidelines for basic skills writing programs. The statement was published in *Education Daily* and in a Support for Learning and Teaching of English (SLATE) *Starter Sheet*, a newsletter of NCTE's SLATE committee on social and political concerns. It has also been adopted for inclusion in a number of state and local school district curriculum bulletins.

At the suggestion of the committee, John Maxwell consulted with the headquarters staff to develop an operational definition of writing. This was appended to the Standards and is included here.

Comments on the Standards — A Personal View

My view of the significance of NCTE's "Standards for Basic Skills Writing Programs" is closely related to the original intention of the statement, which in turn is linked with the purpose of this handbook: "to present information for teachers, parents, and administrators which would help them in defining the contents of the basic skills — at the school and district level." A problem explored in the handbook — how basic skills can be taught "holistically" (in broad, developmental contexts) and in isolation — is also a significant issue in the NCTE statement. The comments that follow, then, will explore the statement in terms of its implications for holistic instruction and isolated skills instruction.

Several items in the "Standards for Basic Skills Writing Programs" imply holistic approaches. The standards call for writing instruction that is "part of an integrated language arts curriculum" (#2); that relates to "other subject matters across the curriculum" (#3); that deals with "all aspects of the writing process: generating ideas, drafting, revising, and editing" (#8); that calls for "complete pieces of writing" (#12); and that is evaluated on the basis of "complete pieces of writing, utilizing a recognized procedure" (#18). The statement's emphases on student-centered writing (#4) and on writing in a variety of forms (#5), for a variety of audiences (#6), and for a wide range of purposes (#7) also strongly suggest a holistic approach to instruction rather than a sequencing of isolated skills. It appears that the authors of the Standards see the learning of writing pre-

Operational Definition of Writing

Writing is the process of selecting, combining, arranging and developing ideas in effective sentences, paragraphs, and, often, longer units of discourse. The process requires the writer to cope with a number of variables: *method of development* (narrating, explaining, describing, reporting and persuading); *tone* (from very personal to quite formal); *form* (from a limerick to a formal letter to a long research report); *purpose* (from discovering and expressing personal feelings and values to conducting the impersonal "business" of everyday life); *possible audiences* (oneself, classmates, a teacher, "the world"). Learning to write and to write increasingly well involves developing increasing skill and sensitivity in selecting from and combining these variables to shape particular messages. It also involves learning to conform to conventions of the printed language, appropriate to the age of the writer and to the form, purpose and tone of the message.

Beyond the pragmatic purpose of shaping messages to others, writing can be a means of self-discovery, of finding out what we believe, know, and cannot find words or circumstances to say to others. Writing can be a deeply personal act of shaping our perception of the world and our relationships to people and things in that world. Thus, writing serves both public and personal needs of students, and it warrants the full, generous and continuing effort of all teachers.

Standards for Basic Skills Writing Programs

An effective basic skills program in writing has the following characteristics:

Teaching and Learning

1. There is evidence that knowledge of current theory and research in writing has been sought and applied in developing the writing program.
2. Writing instruction is a substantial and clearly identified part of an integrated English language arts curriculum.
3. Writing is called for in other subject matters across the curriculum.
4. The subject matter of writing has its richest source in the students' personal, social, and academic interests and experiences.
5. Students write in many forms (e.g., essays, notes, summaries, poems, letters, stories, reports, scripts, journals).
6. Students write for a variety of audiences (e.g., self, classmates, the community, the teacher) to learn that approaches vary as audiences vary.
7. Students write for a wide range of purposes (e.g., to inform, to persuade. to express the self, to explore, to clarify thinking).
8. Class time is devoted to all aspects of the writing process: generating ideas, drafting, revising, and editing.
9. All students receive instruction in both (a) developing and expressing ideas and (b) using the conventions of edited American English.
10. Control of the conventions of edited American English (supporting skills such as spelling, handwriting, punctuation, and grammatical usage) is developed primarily during the writing process and secondarily through related exercises.
11. Students receive constructive responses — from the teacher and from others — at various stages in the writing process.
12. Evaluation of individual writing growth:
    (a) is based on complete pieces of writing;
    (b) reflects informed judgments, first, about clarity and content and then about conventions of spelling, mechanics, and usage;
    (c) includes regular responses to individual pieces of student writing as well as periodic assessment measuring growth over a period of time.

Standards for Basic Skills Writing Programs (Continued)

Support

13. Teachers with major responsibility for writing instruction receive continuing education reflecting current knowledge about the teaching of writing.
14. Teachers of other subjects receive information and training in ways to make use of and respond to writing in their classes.
15. Parent and community groups are informed about the writing program and about ways in which they can support it.
16. School and class schedules provide sufficient time to assure that the writing process is thoroughly pursued.
17. Teachers and students have access to and make regular use of a wide range of resources (e.g., library services, media, teaching materials, duplicating facilities, supplies) for support of the writing program.

Program Evaluation

18. Evaluation of the writing program focuses on pre- and post-program sampling of complete pieces of writing, utilizing a recognized procedure (e.g., ETS holistic rating, the Diederich scale, primary trait scoring) to arrive at reliable judgments about the quality of the program.
19. Evaluation of the program might also include assessment of a sample of student attitudes; gathering of pertinent quantitative data (e.g., frequency of student writing, time devoted to writing activities); and observational data (evidence of prewriting activities, class anthologies, writing folders, and student writing displays).

dominantly as integrated and contextual, not as a series of step-by-step tasks, each to be "mastered" before the next step begins. On the other hand, the statement recognizes that certain aspects of writing might be treated, at least in some sense, in isolation. "Conventions of edited American English ... such as spelling, punctuation, and grammatical usage" are developed "primarily during the writing process and secondarily through related exercises" (#10). Evaluative judgments are "first, about clarity and content," to be sure, but then about conventions of spelling, mechanics, and usage (#12). Further, the statement makes a distinction between instruction in "developing and expressing ideas" and instruction in "using the conventions of edited American English" (#9). All of these items imply the treatment of conventions of edited American English in isolated exercises, at least part of the time.

The picture of writing instruction suggested by the Standards is, then, a basically holistic approach, with primary attention to effective communication of the writer's ideas in relation to his or her purpose and audience. Presumably, the student's writing-in-context reveals problems in spelling, punctuation, and usage that can be treated in appropriate exercises.

This realistic approach runs counter to many conventional English textbooks and curricula, which are based on the assumption that students should start by learning an array of rules, definitions, and labels about writing which they will then "plug into" their communications in the real world. The assumptions in the Standards are also opposed to the romantic belief that students engaged in holistic tasks will be so highly motivated that they will digest the conventions of edited American English readily, almost automatically, once they see how a particular convention relates to their compositional needs.

By insisting that holistic approaches are primary but that appropriate exercises can be beneficial, the NCTE statement holds fast to its first and overriding recommendation — that knowledge of current theory and research be applied in developing a writing program. Recent theory and research in the composing processes of students, in peer interaction and peer editing, in strategies for revision, and in fear of writing suggest that purposeful, audience-oriented writing tasks should be at the center of writing instruction. But some research — most notably in sentence combining and diagnosis of individual student errors — indicates that certain skills taught in relative isolation will carry over into the student's writing efforts. Some researchers and teachers are also exploring whether or not thinking skills used in pre-writing and writing activities can be taught in isolation.

In summary, the NCTE statement leaves ample room for research-tested methods for teaching of separate skills even though it strongly emphasizes holistic instruction as the fundamental approach to basic skills writing programs.

I believe that the implications of this discussion should be clear for parents, teachers, textbook committees, and district-level program writers and curriculum developers:

1. The content of any basic skills writing program should be fundamentally but not totally — and not ideologically — holistic.
2. Commercially published materials that are used in writing programs should deal with the entire writing process, from pre-writing brainstorming and discussion, to drafting, to initial feedback, to revising and editing.
3. Provisions should be made for drills related to specific skills — not through a comprehensive program of formal grammar, but through diagnosis and functional prescription based on the student's actual writings.
4. Inservice for teachers should help them develop techniques for motivating students throughout the writing process, skill in handling large and small group discussion, skill in diagnosing student errors, and methods for helping students to write more effectively at each stage of their personal and intellectual development.

Selected Bibliography

The bibliography which follows is something of a potpourri. Each item, though, contains valuable teaching ideas. A teacher of basic writing skills can use these materials with confidence that the ideas flow from thoughtfully developed theory and research. Moreover, the ideas have generally been effective in classroom situations. Curriculum generalists and parents will see in these materials particular instances of many ideas presented in the NCTE "Standards for Basic Skills Writing Programs." Those involved with inservice or preservice education or the development of a professional library for teachers might also make use of the materials. The letters in parentheses refer to the grade levels to which the books apply: HS–High School; JHS–Junior High School; MS–Middle School; ES–Elementary and/or Pre-Elementary School.

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The Movement toward Meaning-Focused Writing

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Editors' Note: *In this paper Robert Brown, Jr., presents the rationale for a significant change in the emphasis of much current writing instruction. He reviews our current knowledge of writing as a process in which the writer's ideas are focused and changed in the course of writing. Writing is presented as a complex creative process on which the teacher can provide specific help or hindrance. The primary function of writing should be to convey meaning or ideas effectively, and that, Brown emphasizes, should be both the initial and the ongoing emphasis of instruction.*

Writing Instruction and Common Sense

Common sense is a faithful guide for most of us, especially in educational matters where we find ourselves returning — after each experiment with some fashionable new idea — to what made better sense in the first place. In writing instruction many of us have a clear, common-sense view of what ought to be done: "If it's broken, fix it." And with many of our students at all levels it looks like everything is broken. Spelling and punctuation stand out clearest, followed by the collection of problems usually labeled "grammatical": lack of subject-verb agreement, missing or wrong inflectional endings, dangling or misplaced modifiers, tenses wrong or shifting, and the whole text put together out of strings of comma splices and run-on sentences. And then there's "logic" variously defined: ideas tumble over each other, so little information is provided that it's hard to identify what the writer's talking about, great holes gape in the arguments, and the paragraph units — if there are any — are mixtures of topics with no clear path from one to the next.

The common-sense solution often seems to be to break down what's wrong into reasonable categories and fix each one: spelling drills for spelling errors, punctuation work for punctuation problems, grammar review and drill for grammar errors, and practice with logical analysis and methods of "paragraph development" to correct the many ways the essays go haywire. Each symptom gets a specific remedy. It is this view of writing instruction that has persisted from the seventeenth century through recent "back-to-basics" approaches. The assumptions upon which such a view is based are so commonly held, such a part of our culture, that it's hard to imagine any other way of proceeding. What are those assumptions? Most people see writing as the business of making *products* of different kinds — essays, letters, poems, short stories, or whatever. And good texts have certain good parts: correct spelling, topic sentences, a clear introduction, and the right mix of sentence types are some of them. So it seems natural that writing instruction should be organized by treating each part: a unit on sentences, one on

words, one on paragraphs, one on figurative language, and so on. From the skills for making each *part* of good writing will come good *products*. So goes the grand plan underlying most textbooks and most writing programs — writing is a series of skills for making the various parts of the finished product.

But why doesn't it work? Anyone who has been talking with teachers knows that most writing instruction doesn't work. Most teachers feel, rightly, that they're overworked. They say that they *ought* to assign more writing, but that they're intimidated by the prospect of having to read the resulting hundreds of pages of student work, a genuine concern I'll address later. But most also feel that the results they get don't match the effort that they and their students put in. Most important, equivalent work in other areas — literary studies, social science, history, even grammar — yields far more than writing instruction ever does, and the most perceptive teachers know that *even if they were able* to devote the time they feel they should to writing instruction, the results would only be disappointing.

Those of us who teach know we're not incompetent, and we know that as bad as the problems of overcrowding, morale, discipline, and school life generally may be, students can and do learn in some areas. But they do not learn to write easily, a fact which suggests that many of our traditional views of writing instruction are simply wrong. Current research in language, learning, and writing supports this view. All the signs, in fact, point to the conclusion that what passes for common sense in writing instruction may not be common-sensical at all.

We need to redefine the basics to get at what is really basic. When we know something about how the mind works, and what is involved in writing and learning to write, we find our common sense leading us in interesting new directions. My intention here is to give teachers and others concerned about teaching writing this necessary knowledge so that they will be able to design writing programs appropriate for their particular students, and so they will understand why so much teacher effort, concern, and general good will often result in very little improvement.

Why Writing Is a Difficult Skill to Understand

Most professional writers, and experienced writers in general, know that they don't write the way textbooks say writing should be done. They claim never to "find a topic, narrow it, garner support, and outline." Instead, they find problems to be solved or a specific audience to be informed, taught, insulted, or praised, or they pose questions to answer. They spend considerable time in thought, much of it pretty chaotic — or so many writers claim. They jot and scribble. They start and restart. They throw out vast chunks of their drafts and cut-and-paste others. They think consciously about an audience full of surly objectors whose queries must be answered, whose obtuse refusal to understand must be met with great amounts of explanation, and whose disagreements must be countered. And, crucially, they worry little about the formal patterns of manuscript form, punctuation, spelling, and sentence and paragraph structure until the final, polished draft. Although they claim never to write according to the prescriptions of textbooks, they accuse themselves of sloppy thinking for not doing so.

They probably shouldn't feel guilty. Current research on the writing process confirms our suspicion that *no one* writes as the books describe and shows further that experienced writers, as a result of having acquired the complex skills that constitute writing ability, have different habits of mind — "cognitive strategies" or "cognitive styles," as they're called — from those of inexperienced writers. From these few points we can draw four very important conclusions about the very special nature of writing and the effects of learning to write on peoples' thinking.

First, writing is a process, largely internal and mental and involving many separate faculties. Most of the work of writing, at least for experienced writers, goes on in the mind before a single mark gets made on the paper. And even after the actual writing begins, much of the real work is *thinking* with words. The product, the words on the page, is only the tip of a huge cognitive iceberg; and that is the *process* we need to teach. But little traditional instruction treats this process. Instead, it often begins —

after a few words about selecting and narrowing topics — by asking for an essay or story of some number of pages or words.

Second, learning to write literally changes a person's mind. Writers (who, interestingly, are also always competent readers as well) process information differently from non-writers. Writers have a greater range of cognitive strategies than non-writers; they are more orderly in the way they go about solving problems, and they are able to see more alternative approaches to any given problem. So the writer thinks differently from the non-writer, and it is this broadening and clarifying of thinking processes that makes the best argument for a good writing program.

Third, experienced writers are not aware of their own cognitive processes, and they are usually unable to imagine how it is possible to think any other way. It's here that the problem arises for many teachers: they have been writers and readers for so long that they are unable to understand the very different minds of their non-literate students. As a result, what seems like good, clear, sensible advice to a teacher often may as well be in Sanskrit for the tenth grader who receives it. What, for example, have we told a student when we write "logic" in a margin to draw her attention to a piece of illogical prose? Unless perverse, the student hasn't intended to be illogical and will not understand how to correct the problem. She *will* know it's an error, though, and will learn once again that writing is full of hidden traps. We must make sure that we have taught — and that the student understands — the process for developing an argument from start to finish, so that the eventual product won't contain faults in logic.

Fourth, and finally, we can't help people learn to write by describing the formal patterns in written products. Every teacher knows how little good it does to teach a class any of the usual formal models, such as paragraph development modes. We run the class through a series of exercises to introduce them to development by "topic sentence, sentence of support, and a sentence of conclusion." We give them examples of such paragraphs and have them underline topic sentences, only to find that the next essay turned in is as undeveloped as the last one. We might as well try to teach pastry cooking by dissecting pies — good ones and bad ones — showing the student chefs light, flaky crust and how it's not at all like a stiff soggy one. They can see the difference clearly enough. What they need is guided practice in making their own.

So several things are clear. First, proper writing instruction must emphasize the whole writing process in order to teach how to *do* writing, not just to show them what good writing products look like. Second, we should recognize that much of our writing instruction will not have to do with having students make texts, but with trying to make explicit what good writers do before and during their actual drafting. It will break down and make explicit those hidden mental operations that make up real writing. Finally, we should recognize that we are rather different from our students. In a sense they are like young children in the early stages of language acquisition: they think differently from us, and what's clear to us may be very foreign to them. Fortunately, we now have sufficient information from current research in writing and language to tell us how the writing process works and how we can best help our students' minds to develop.

Learning to Write and Language Use in Everyday Life

Why is it that as scores on various national tests dropped in the 1960s and 1970s, scores based on verbal skills went down more than those based on quantitative skills? We usually explain declining scores by pointing out overcrowding, underpay, and problems of a general moral/morale nature. But those things cause problems equally for *all* teaching. Language research points to a powerful general explanation. Quantitative skills depend little on everyday experience; most of us learn all our mathematics, for example, in school. Not so verbal skills. A child entering school at age six is already an accomplished language learner, having mastered the complex grammar of language. And during all the years of school, the major influence on a person's language ability is the language experience encountered *outside* the classroom. What we do in schools is simply to try to add to the student's repertoire of language

abilities — a major part of this responsibility is to teach the student the rather rare and specialized abilities of writing. Two things fight us in this job: first, writing is very little like speech, and, second, the role of written language in society has changed radically in the last few years. Cognitive skills basic to writing are learned from experience other than schoolroom training: from problem solving in various areas, from reading, and from oral discussion, for example. Today's students write little outside of school, but they also don't read much, and when speaking, they seldom speak long without a supporting response. Students of twenty years ago — at least those more academically oriented — brought more of these relevant skills to school with them; today, schools must provide most of the experience.

. . . proper writing instruction must emphasize the whole writing process in order to teach how to do writing, not just to show students what good writing products look like.

We can quickly get a sense for the type and range of skills writing requires by comparing writing and everyday language use. We can also come to appreciate how big the job of learning to write is for most students. And from all of this, we can see just *where* choices are possible in designing a basic skills writing program.

Today's students — most people, in fact — are conversationalists; conversation, not writing, is the model for language use. And their habits of mind, their language skills, are those of conversation, not writing. Some points about the nature of conversation follow:

1. *Conversation isn't sustained and it's not structured.* Conversation goes by two or three sentence chunks, each interspersed with a response which gives speakers immediate feedback on how their speech is being received. In conversation, if the audience is lost, skeptical, or confused, the speaker knows about it immediately and can change language strategies to correct the problem.

And conversationalists seldom need to structure and plan a long, complex argument or explanation in their minds before they begin to speak. Instead there's *no* set structure; the topics arise as the conversation grows or are dictated by the activity. Researchers find that when long stretches of speech do occur, they're most often narratives, organized by events in time. And narratives are probably the easiest to structure: very young children (about five years old) can handle them with ease, and college freshmen who are unable to organize short-essay exam questions feel comfortable with journals and personal stories. They can do it just because they have had everyday experience with story telling, and because all they need to do to form the story is consult their visual memories for "what happened next" and tell or write about it.

Researchers have found that this ability to form and understand long and structured stretches of language is the major cognitive difference between literate and non-literate students. A person who can *write* a paragraph of explanation, for example, will also be able to *read* one with speed and ease, since the same psycholinguistic mechanisms operate for reading and writing. Persons who can't write one, however, will respond very strangely on tests of reading comprehension: asked to summarize a paragraph of prose, they will remember the last parts read best, the first, worst. They will not be able to capture the general idea in a sentence or two of their own, and, when asked to summarize the ideas, they'll use actual pieces of the text — sentences, phrases, and words — while literate readers will just invent a sentence or two of their own.

It seems that a very basic skill for writing is the ability to form large stretches of language with specific structures. It is not a skill that comes from everyday experience with conversation. And it's not a skill limited to writing but a very basic cognitive ability, a way of thinking which lies behind reading, writing, and more complex speech. Further, as I'll explain shortly, it's a skill so basic that until it's mastered, other writing skills which depend upon it simply can't be taught.

2. *Conversation isn't explicit.* Human beings are practical creatures who never expend more linguistic energy than it takes to get the job done. In everyday conversation, we're used to speaking to an audience with whom we share a huge store of common knowledge. So frequently we need only make a small linguistic gesture toward our meaning, and our audience will figure it out — "You know what I mean?" The point is just that most of the time they *do* know. When a spouse or roommate says, "Where is that stuff?" meaning the new bottle of almond extract for the Christmas cookies, you probably can answer, "On the kitchen sink board," with little hesitation. And speakers whose primary language experience is of this sort have great problems imagining — and writing to — an audience which shares little with them in attitudes, beliefs, and factual knowledge.

The consequences can be seen in each aspect of writing. In syntax, for example, we find that students at every level prefer the simple, subject-verb-object sentence to the "embedded" or "subordinated" forms of mature writing. Student writing, even that of college students, is often a string of simple sentences hooked together by a conjunction, usually *and*.

One of our freshmen, writing about his decision to study agricultural engineering, produced the paragraph below — largely simple sentences linked by conjuctions:

> My dad farmed all his life. We have 600 acres down by New Prague. He never really got ahead. When prices were up, we did pretty well, but when they were down, we hurt. He just couldn't see ahead. I'm not letting that happen to me. I'm going to learn *how* to farm. I'll be an agricultural engineer.

The reader must — and easily can — make the logical connections. But with subordinated sentence structure the relations are made clear in the text. For example,

> Having watched my dad farm our 600 acres down by New Prague all his life and never really get ahead, I've decided to learn *how* to farm. I'll study agricultural engineering, freeing myself from being tied to market conditions by learning to see ahead.

Appeals for sentence variety, exercises in the grammatical bases of sentences, and practice with copying sentence models all have the same dismal results. The students become too anxious to fill a page, suddenly blossom into weedy excess and inappropriateness, or remain the same. Shortly, as one of my recommendations, I'll suggest a workable solution. But for now, a brief explanation.

When we examine transcripts of everyday speech, we find very few complex, subordinated sentences. In fact, we find few sentences at all, since most conversation is an exchange of sentence fragments. So is much advertising copy in printed and electronic media. Most people have few occasions to form and use complex syntactic forms, and only a few more opportunities to read them. As a consequence, most student writers are not "syntactically fluent"; they *know* how to form all the types of sentences in the language, but they don't have them at the tips of their tongues or fingers. They haven't, in fact, developed the cognitive ability to plan and execute complex sentences. Certain very specific areas of the brain are not trained to automatically organize the concepts into the required complex structures; as a result, students with complex ideas to express often struggle so severely for the syntax to handle it that they end up like beginning roller skaters: falling all over the place and getting nowhere. Many ostensible "grammar errors" are really the result of this cognitively based syntactic unfluency, not of students' unfamiliarity with rules of grammar, and no amount of ordinary grammar study will remedy the problem.

Though it may seem unrelated, the perennial problem we label "vague," "undeveloped," or even "incoherent" writing has the same source as student writers' impoverished syntax. Researchers often talk about beginning writers (of whatever age) as "egocentric," and, stripped of its psychotherapeutic or moral connotations, the term's a good one (Britton et al., 1975). We all form our language according to what we *think* our audience is like; we make automatic, unconscious guesses about their minds. We're only as explicit as we need to be; we only spell out

the logical connections between ideas when we think the audience won't figure them out on their own, and we only provide long, reasoned arguments if we think we'll encounter objections. The more experience we have in communicating with people very different from us, the better we become at adjusting what we say or write to very different minds. The conversationally trained student who's used to talking *only* to people much like him, and to people whose background knowledge is much the same, will write and talk *as though writing or talking to himself* and will be shocked to find that the message hasn't been received.

So a variety of apparently dissimilar problems — improvished syntax, lack of details, lack of logical connections, underdeveloped ideas — all share the same source. We only get good at things we *need* to do. And modern Americans have very little need to form complex, extended, texts which state their meanings fully rather than *assuming* that the reader or hearer will "fill in" the missing information from the vast body of knowledge he or she shares with the speaker or writer.

I've ignored the obvious and more usual differences between writing and speech: the special rules of spelling, punctuation, and manuscript form, the special constraints on syntax and usage, and the expanded vocabulary. I've done so because I want to suggest that they're not our primary concern in working with today's students. I realize this seems to violate common sense. After all, nothing stands out in a piece of writing like barbarous usage, spelling errors all over the place, and punctuation scattered over the page like mushrooms on a pizza. These are just the things that infuriate parents, concerned citizens, and employers. And they *are* important; no writing program would be complete without treating them. Since they're all skills which must be learned by memory, they must be addressed early on and treated — in small systematic, regular chunks — all through the grades. It is these skills that must be addressed through an individual skills approach. But these skills are only a small part of writing. Students who master only these skills (if that's possible — and it probably isn't) will only be able to produce products which *imitate* writing.

The more experience we have in communicating with people very different from us, the better we become at adjusting what we say or write to very different minds.

First Things First: The Writing Process and the Teaching Process

Anyone who jogs knows about "referred pain," the mysterious process by which the ache in your leg has its source in some pinched something or other in your lower back. It does no good to massage the leg; the symptom's not the problem, and the cause is far away. There's an exact analogy in writing, "referred errors," perhaps. Most researchers see writing as a complex skill involving such disparate things as control over the nerves and muscles of the writing hand, the idea-structuring, audience-analyzing, and sentence-forming operations I've discussed, and all of the usual vocabulary, punctuation, and mechanical skills involved in making the final draft. They've also discovered that many of these skills *depend upon* each other in interesting ways. Clearly, some must become automatic before others can be learned. Beginning writers who are asked to "write an essay" without help in the preliminary steps must handle all the skills simultaneously. *They can't*, and confusion in one area manifests itself in others, so that in writing, as in sports medicine, treating the symptom won't get at the cause. (See Shaughnessy, 1977, for further discussion of these points.)

The clearest example comes from watching what happens when anxious, beginning writers are asked to concentrate on the details of mechanics, surface grammar, usage, and other matters of manuscript form, that is, on making an error-free product. Simply said, they're paralyzed. Mina Shaughnessy gives this perfect example of a beginning writer, unsure of himself and terribly afraid of erring in his attempt to write the perfect first sentence. He rewrites a perfectly good sentence into perfect garbage:

Start 1
Seeing and hearing is something beautiful and strange to infant.

Start 2
To a infant seeing and hearing is something beautiful and stronge to infl

Start 3
I agree that seeing and hearing is something beautiful and stronge to a infants. A infants heres a strange sound such as work mother, he than acc

Start 4
I agree that child is more sensitive to beauty, because its all so new to him and he apprec

Start 5
The main point is that a child is more sensitive to beauty than there parents, because its the child a inftant can only express it feeling with reactions,

Start 6
I agree a child is more senstive to seeing and hearing than his parent, because its also new to him and more appreciate. His

Start 7
I agree that seeing and hearing have a different quality for infants than grownup, because when infants come aware of a sound and can associate it with the object, he is indefeying and the parents acknowledge to to this

Start 8
I agree and disagree that seeing and hearing hove a different quality for infants than for grownups, because to see and hear for infants its all so new and mor appreciate, but I also feel that a child parent appreciate the sharing

Start 9
I disagree I feel that is has the same quality to

Start 10
I disagree I fell that seeig and hearing has the same quality to both infants and parents. Hearing and seeing is such a great quality to infants and parents, and they both appreciate, just because there aren't that many panters or musicians around doesn't mean that infants are more sensitive to beautiful that there parents. (1977, pp. 7-8)

A related problem occurs with students who have done little actual writing and have therefore not brought the nerve-and-muscle networks responsible for small muscle movement of handwriting under control. The words won't flow; it takes all of the writer's attention to worry about transcription. Often the errors which result *look* like grammar problems, for example, failures of agreement caused by the writer forgetting that the subject is singular because a modifying clause with a plural noun has come between the subject and verb. It does little good with such students to mark the errors, comment on the logic, or drill them in grammar. First they need to *write — a lot.*

If the research on language, learning, and thought processes which I've discussed is correct, the choices we have in designing writing instruction are fewer than we may have thought. There's some good news and some bad news. First the bad news. We've probably consistently underestimated the complexity of what seem to be simple and typical writing assignments in all subject areas. "Write an essay discussing the case for banning general admission seating at rock concerts" is an impossibly complex demand on many college freshmen just because it asks them to confront too many rhetorical problems at once. Such assignments — and ones like them at lower levels — must be broken down into a series of clear, small steps to help the students explore and organize the topic, decide on a purpose for their writing, identify and analyze an audience, and adopt a definite voice before they begin to write.

In addition, much of our effort may well have been exerted in less-than-useful directions. By themselves, exercises in grammar, vocabulary drill, mechanics, punctuation, and usage will not significantly or permanently improve students' writing ability. In a recent study, to be published soon, Charles Cooper found that these aspects of writing had little effect on the way readers judged the quality of essays. What the readers were looking for was such things as clear overall structure, a well-defined purpose, coherent units within the text, clear logical structure, rich and complex ideas, and fluent syntax. Other research, including mine with University of Minnesota students, shows that the improvement from the usual workbook, drill, and formal pattern-practice teaching is short-lived. Minnesota students tested in 1976, six months after taking a traditional course in grammar, mechanics, and usage, were back to nearly the level at which they began, while stu-

dents who learned to write in a process-based course held their level of accomplishment.

Most crucially, we will waste our efforts if we try to teach skills that depend on other skills not yet mastered. There's a general but necessary order for teaching writing, and if we ignore it, we'll end up with frustrated and anxious teachers and students. At all levels, we find that students who feel a clear *need* for some writing skill in order to express an idea important to them will learn the skill willingly and well.

Now for the good news. First of all, there are many perennial writing problems which will cure themselves in an affective, process-oriented writing course in which students write a great deal in a supportive, exploring, and challenging environment. Among the problems are most of those related to "grammar," incoherence, vagueness, and insufficient development. Second, freed from the need to mark every error on every paper, teachers can easily — and with clear consciences — assign more writing and writing-related projects in all subject areas. Finally, and, most important, when we come to see writing as a process, we can give over much of the teaching process to the students themselves.

So What Do We Do?

A writing program provides students with the language experience which is necessary for writing and which is absent in their everyday lives. It fills in the holes left when the written language (and speech structured like written language) stopped being a major part of most people's lives. The writing program is given little time in the curriculum, so it must be *efficient*, and it must be *consistent*. Any contradictions between teachers or between grades undermine the students' confidence. It can begin as early as first grade, and it must *continue* in every course of the curriculum through every grade.

My rather long discussion of the nature of writing and writing problems should indicate how the best programs can work. Now for a few simple, specific suggestions:

1. *Writing must be taught as a process, with first things first.* At every level, and in every writing project, teachers must treat each part of the writing process: *prewriting, drafting, revising, and editing.* And teachers should emphasize that the process is often not straightforward; writers often find that an idea that pops up in the process of editing what should be a final draft needs to be explored and developed with further prewriting techniques to become a complete new section or piece; we never get completely there. And it's only when we feel that we've come as far as we can in exploring, revising, and rethinking that we begin to think about forming a final draft with elegant sentences, the best words, and the commas in their proper places. Courses must reflect this sensible sequence.

   Students who understand the writing process and courses based on it feel much freer to experiment, to take chances, and to learn through writing. Practice in the techniques for prewriting and drafting must come first. Students develop the text-forming skills conspicuously absent in everyday experience. And when they *do* encounter the usual punctuation, grammar, mechanics, and spelling work as part of the *editing* stage, they understand its function and learn it willingly and easily.

Writing must be taught as a process, with first things first. At every level, and in every writing project, teachers must treat each part of the writing process: prewriting, drafting, revising, and editing.

2. *Student writers must talk to each other.* Writing is best and most easily taught as a collective activity, and students can take over much of the work usually done by teachers: they can learn to assess their own and each other's work. At every stage of the writing process, students should read each other's writing, share ideas, ask each other questions, and generally provide the immediate, specific responses necessary to lead each other out of their egocentric views of language. *Writing conferences* — student/teacher, student/student or groups with or without a teacher —

may be the strongest single teaching device we have.

The conference does *not* correct the paper. Nor does it explain its structure — at least as *we* would explain it — with grammatical terminology and economical, pointed comments, nor does it direct the student to a perfect revision. What it does, simply, is provide a place for student writers to practice being audiences: reading prose, responding to it, positing alternatives, and clarifying their instincts about writing. Students in conferences are learning how to read as *writers* read — comparing what they've written to what they meant to say. It's this ability to see dissonances between what's written and what's meant that separates experienced writers from beginners. And it's that perceived dissonance that motivates both rewriting and growth in writing skill generally. Some researchers have suggested that this ability to assess writing — particularly to assess your own writing — may be a central writing skill, though it's one that we cannot evaluate by the usual tests or even by judging students' essays.

3. *Sentence-combining practice should begin in the middle or upper elementary grades and continue through high school.* We seldom encounter one teaching technique that works consistently at all levels, that solves a range of problems, and that finds overwhelming support from empirical research. But sentence combining does all that. And it's relatively foolproof. It develops students' syntactic fluency by allowing them to make complex sentences out of simpler sentences organized so that they will go together to form coherent large sentences, groups of sentences, whole paragraphs, or even complete essays. The beauties of the techniques are many, but the primary one is that *all* students can do the exercises, so there is no fear of failure. A fringe benefit of sentence-combining work is that as students' syntactic fluency increases, they also begin to understand sentence boundaries and write fewer and fewer fragments and comma splices. They also begin to understand the principles by which sentence structure helps form coherent paragraph units. The varieties of exercises and the research background are so vast that I can't reasonably summarize them here. Mellon (1969) and O'Hare (1971) are the authors of the two major theoretical books that began the enterprise. Three excellent textbooks at three different levels are included in the list of references (O'Hare, 1975; Strong, 1973; Daiker et al., 1979).

4. *Finally, teachers must know the best new information about language, learning, and children.* No textbook or new program, however good, will do the primary job of teaching for us. Conversely, good teachers need very little in the way of materials to teach writing, since writing is learned *by writing* under the direction of a good teacher who can explain what's going on in a student's work and how to change it. Curricula and textbooks lag far behind what we do know, and common sense is often misleading. The instincts of a good and humane teacher, informed by the best that's known and supported by other teachers in all subject areas, are the best guide.

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The Writer as Experimenter

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Editors' Note: *Thomas Newkirk provides further support for the meaning-focused approach to writing, as discussed by Brown in the previous paper. The major emphasis of this paper is on approaches to teaching writing and on the planning of an entire writing curriculum. Newkirk provides specific suggestions on what the teacher should look for in reading a student's draft and what kind of feedback can be helpful to the student. Procedures for helping students help each other are also discussed. With proper guidance, students can be effective teachers. Thus, the teacher can assign more writing, and students can get more feedback on early drafts of papers.*

Four Assumptions

At age two, most children are speaking in single words or in short telegraphic sentences. Four years later, they have mastered the major grammatical rules of the language, a stunning learning feat — miraculous if it weren't so common. Even "mistakes" ("ringed" for "rang") testify to children's capacity to perceive a rule and apply it to a new situation. In almost all cases, this learning proceeds without formal instruction. Children attend to the language around them and particularly to the ways in which their parents expand their early telegraphic sentences. Young children experiment incessantly, creating sentences that are closer and closer approximations of those they hear. Thus, the first assumption — *the six year old who enters school is not a beginner, but an accomplished language learner.* A writing program should provide an opportunity for the same kind of experimentation that has been used successfully by the child in learning to speak. It has been said that if we were all taught to speak in the error-oriented way most of us were taught to write, we would be a nation of stutterers.

The second assumption is that *children learn language because it can help them fulfill intentions.* Language is functional. The very first words learned are those of special importance to the child because they name something special ("Momma," "Dada," "dog") or because they can regulate behavior ("all done," "more," and, of course, "no"). Language soon becomes an adaptable instrument for realizing intentions. Unless the child (or language learner of any age) can see some use for an aspect of language, it will not be learned. Frank Smith writes:

> Children must understand the intention. If they can see no purpose to an aspect of language, if they cannot see that it makes any difference, they will not attend to it. It is because children are only concerned with the purposes to which language can be put that they grow up speaking language and not imitating the noise of the vacuum cleaner. (1979, p. 120)

Smith's statement holds true even for learning the conventions of language usage — spelling, punctuation, capitalization — that figure so prominently in the debate over the basics. Lucy Calkins (1980) has found that third-grade stu-

dents taught punctuation indirectly, through conferences on their own writing, learned it more effectively than a group taught punctuation directly, by means of exercises and drill. She found the group taught indirectly used more types of marks (probably because they wrote more and used a greater variety of sentences), and they used them more accurately.

Even more striking were the reasons given for using punctuation. The group taught indirectly saw punctuation as a device for helping them say what they wanted to say. Exclamation points (often used by the dozens) helped create emphasis; their sentences could shout. Students used commas to get rid of all the "ands" that connected words in series. The device saved work, and the series sounded better. Periods showed the reader where to pause. Otherwise, explained a student, "one minute you'd be sledding down the hill, and the next minute you're inside the house without even stopping."

By contrast, those taught directly often saw no use for punctuation. It was just one more difficulty foisted on them. Their reasoning about punctuation reflected the workbook mentality. One student, when asked how he knew when to place a period, replied, "Easy, you put it right before a capital letter."

Writing is a natural activity that can begin very early. The urge to write precedes even the urge to read. This third assumption runs counter to much educational practice. Often teachers will delay teaching writing until the second or third grade, feeling that reading must come first and that, unless the child can spell a number of words correctly, he or she cannot begin to write. We still call elementary schools "grammar schools," the implication being that students need to know a great deal about language before they can use it.

Carol Chomsky (1971) has shown that young children, between the ages of three and four, have an urge to write that is similar to their urge to draw. They use what has been called "inventive spelling," employing at the beginning only a handful of consonants and vowels. Initially, the writing is pure self-expression; the child doesn't care if anyone else can read it. The lack of concern for audience allows the child to experiment freely and fearlessly. Gradually, as the child is exposed to more written language, the spellings approach the conventional. For example, a four-and-one-half year old wrote:

YUTS A LADE YET FEHEG AD HE KOT FLEPR
Once a lady went fishing and she caught Flipper.

Eight months later the same child wrote:

WUNS A LITL BUNE HOPT A CROS MI LON
Once a little bunny hopped across my lawn.
AND THAT BUNE HOPT RUYT IN MI HOWS
And that bunny hopped right in my house.

It is possible to recoil at these misspellings. Yet to delay writing instruction, to insist on perfect spelling as a prerequisite for writing, is to deprive the child of a rich time of experimentation and learning.

The fourth assumption is that *language is intimately related to thought.* We use language to convey meaning, but more critically, we use language to discover meaning. Experience and knowledge do not come prepackaged; any learner must sort and sift, give shape and meaning to the new, relate the new to the pre-existing. Even the most austere scientific report has its beginning in the notes and casual exploratory talk of the scientist. It follows then that in any subject which requires them to think (and those subjects which don't should have a tenuous status), students should be required to use exploratory language, including writing, to make sense of what is to be learned. Paradoxically, the more learned a student sounds (that is, the more like a textbook), the less likely it is that he or she has truly mastered the material, that is, has brought his or her *own* language to bear on the content.

Teaching the Writing Process

If tennis coaches only scheduled matches and kept score, we would probably think they weren't doing their job. Yet traditional writing instruction requires little more. Teacher assigns; students write; teacher grades. The student is given no help along the way. If writing is taught as a process, the teacher is involved at various stages of the writing, particularly during the stages of prewriting and revising.

Prewriting, as the term indicates, includes those activities which help the writer discover subject, information, focus, and point of view,

usually before the actual writing of the piece begins. For young children, drawing is an important form of prewriting. The child in the early elementary grades often doesn't know what he will write until the drawing is finished. Indeed, the drawing and writing are often viewed as inextricably bound. The drawing on the next page, done by a second grader, illustrates this close relationship. The writing bends around the drawing to form one unified creation. As the child moves out of this stage, the drawing comes to be done after the writing and serves as illustration. Then, for many children, it disappears or, more probably, becomes a purely mental picture.

Talk can be a form of prewriting. British educators have persuasively argued that talk is not only essential to writing but to all thinking:

> ... the rapid exchanges of conversation allow many things to go on at once — exploration, clarification, shared interpretation, insight into differences of opinion, illustration and anecdote, explanation by gesture, expression of doubt; and if something is not clear you can go on until it is. (Britton et al., 1975, p. 29)

There are a number of ways to encourage talk in the classroom — small group discussions, class discussions, informal debates, interviews with classmates, and interviews with outside experts. One of the best techniques I've seen is a variation of the ancient and wonderful practice of "show and tell," an activity that can work on any level. Each student brings to class something of importance, and the class asks questions to discover its significance. After the questioning, the students write.

Writing itself is a form of prewriting; by writing we discover more to write. We begin a grocery list thinking we want six items, and the mere contact of pen to paper helps us think of twelve more.

Literature can also be a useful stimulus for discovery. The healthiest relation of literature to writing instruction, at least in the pre-college years, is not as content for writing (book reports, analyses) or as a model that students (justifiably) resent being asked to imitate. Literature, especially when read well aloud, can be a spur to memory; it can call up kindred experiences. A student can listen to Mark Twain's description of the Mississippi and sense the tranquility of floating on the raft at night. Not only can the student be moved by the literature, but she can be reminded of her own private place that brings her peace.

I do not want to suggest that literature which is read aloud should be limited to established writers. Students write literature too, sometimes as evocative as that of professionals and often more real to their peers. One of my college freshmen wrote the following as the opening to a description of his job:

> *I pulled open the heavy exit door and stepped in. It began to close behind me, but suddenly flung itself open as I stepped on the triggering mat. That was the way all the employees had to enter the store before hours; the entrance door remained locked until the store opened. Most of the workers seemed to know just where to step before coming through the exit door so that it would not reopen after they entered. I never bothered to learn that trick; for me it was always a good feeling knowing it would be easier to walk out than it was to walk in.* (Vince Graziani)

Most of my students have worked at some time, and they recognize this feeling; the writing stirs memories.

Revision, literally "seeing again," refers to changes made in an original draft: major additions, deletions, and reordering of information; changes in tone, focus, and point of view; or changes in sentence structure, spelling, and other conventions of written English. At the heart of the revising stage is the teacher-student conference. At these conferences the role of the teacher is not that of final evaluator but of sensitive reader, alert to strengths and possibilities. The conference is *not* an oral version of written comments where the teacher tells the student what's wrong and what needs to be done. Nor does the teacher play non-directive therapist and withhold judgment. The conference is an exchange of perceptions, a dialogue.

Since many teachers, particularly those at the secondary level, have large teaching loads, these conferences must be short. They should focus on only one or two major problems at a time. This focus should shift as the student moves through the process. It is hardly productive, for example, to offer counsel on the semi-

His spider has made a egg sac. The spider had made (a) little web.

colon when a student is groping for a focus. Such instruction should wait until an editing session near the end of the process.

A writing teacher needs to define a sequence of focuses that can both match the progression of the writing process and direct the teacher's own reading process. At least three different stages can be distinguished (Newkirk, 1979).

Reading for discovery. One of the major problems, perhaps the major problem, of student papers at all levels is underdevelopment. The writer fails to adequately anticipate the information needs of the audience. He describes Lake Winnepesaukee as "breathtaking" but fails to realize that readers still won't know what Lake Winnepesaukee looks like.

Early in the process, the teacher often has to read what isn't on the paper. The paper should be read with a benevolent tentativeness, the teacher looking for the opportunities, the possibilities implicit in the piece. At this stage the following questions can help guide the reading:

What is effective in the draft?
At what points does the paper need more detail?
At what points does the paper need further documentation?
Is the paper sufficiently complex? Are important alternatives explored? Are important questions answered?
Is the paper focused? Does it seem to say one thing? Does it make one dominant impression?

Reading for arrangement. Once the student has discovered the focus and located the necessary information, the teacher needs to examine how that information is arranged. A new set of questions should be asked:

What has been improved?
Does the beginning begin the piece?
Does the ending end it?
Is the information presented in a clear order?
Are transitions between paragraphs effective?
Are there any weak sections that can be eliminated?

Here, the emphasis is not on generating but on cutting and tightening.

Reading for language or style. Once the problems of content and organization have been resolved, the reading focus should shift to sentence structure and mechanics. It is not the teacher's job to be the student's proofreader, responsible for locating every error. Rather, the teacher should read a sample of the student's work, no more than 500 words. If there are major problems, they should appear in that sample. Once these difficulties have been explained, it is the student's job to complete the editing. At this stage the following questions can be useful:

When possible, has the student used the subject-verb-object sentence, thus avoiding the wordiness of the passive voice and sentences beginning with "there is" and "there are"?
Are there sentences that can be profitably combined?
Is the movement from sentence to sentence clear?
What types of spelling errors is the writer making?
Are sentence boundaries clearly marked?
Has the writer violated rules of usage or punctuation, drawing attention away from the content?

The goal here should not be the detection of a great number of errors, but the diagnosis of a major type of error. Such a disciplined approach suggests to students that their problems with sentence structure and mechanics are manageable.

It is not the teacher's job to be the student's proofreader, responsible for locating every error. Rather, the teacher should read a sample of the student's work. . . . If there are major problems, they should appear in that sample.

Students can also benefit from responses of peers to their writing, by pairing and swapping papers, sharing in groups of four or five, or sharing with an entire class. Most of the problems in running workshops seem to occur at the beginning of the course. Like any type of group work, workshops may be unproductive if students are given no guidelines. Listed below are some problems and possible solutions:

- *Students are reluctant to share.* Here the teacher can be a model and share his work with the class. One possible way is for the teacher to free-write on the board while the class also free-writes. The class can then comment on strengths and weaknesses. Another way to ease anxiety is to begin by having students work in pairs, a less threatening format than sharing with a large group. Finally, initial comments can be limited to specific strengths of the papers read.
- *Students' comments seem erratic and off the mark.* Often students will offer evaluations and suggestions without attempting to understand what the writer is trying to say. One way to avoid this is by structuring responses so that students summarize the main idea of the piece. Peter Elbow suggests the following sequence:

  1. Give a 15-second summary of the main points of the piece.
  2. Condense the summary into a sentence.
  3. Summarize it in a word that is in the piece.
  4. Summarize it in a word that is not in the piece. (1973, p. 86)

  Another form of summary would be to have students think up alternative titles.
- *Students begin by focusing on mechanical errors.* The teacher can avoid this problem by giving students specific questions, such as those listed in the section on conferencing. Or, rather than duplicating papers, students can read them aloud and classmates never see the handwriting and spelling.
- *Students try to rewrite the paper for the writer.* If, in a workshop, students attempt to rewrite the paper, they are making decisions that the writer should make. The purpose of the workshops is to clarify and explore the reactions of readers to the text, to answer the question, "What happened in you when you read the words this time?" Peers can locate problems, places where the writer's intention is not fulfilled, or where they are confused. But it is the writer's job to solve the problems that the group has uncovered.

The approach I've outlined would require changes in the way most classes are organized. More time should be devoted to writing. A survey of U.S. high schools in the 1960s found that English teachers devoted 16 percent of their time to writing instruction (Squire and Applebee, 1968). Results of national writing assessments carried out since the Squire and Applebee study suggest that, if anything, the amount of required writing has declined (Mellon, 1976). Graves (1977) has shown that language arts texts, which form the heart of many elementary programs, virtually ignore the composing process. The sad fact is that writing has not had a high priority in schools.

The teacher should spend more class time working with individual students and less time giving full class instruction. While the teacher is conferencing, students can work independently — writing, sharing their writing, or doing other class work. By dealing with papers in class, teachers can actually reduce the paper grading load that grinds so many of them down. Each paper dealt with in class is one less paper to be taken home.

Most writing programs that use the process approach require a certain volume of writing (a set number of pages per week, for example) with revisions counting toward that requirement. Then, at certain points in the term, the student selects her best work from her folder to be graded on criteria such as those suggested by Donald Murray:

- **Information** — Is there an abundance of information? Is it specific? Is it accurate? Is it honest? Is it used effectively to develop and document what the writer has to say?
- **Subject** — Has the student found his or her subject(s)? Is the student an authority on the subject? Has the student made the subject worth reading about? Is the writing focused on the subject? Is the subject limited — developed and completed? Are the reader's questions answered? Does the writing have a meaning?
- **Structure** — Is the writing ordered? Are the readers' questions answered when they are asked? Are the title and the lead honest? Do they lead the reader toward the subject? Is each point documented? Does the ending work to bring the writing to a satisfying conclusion?
- **Language** — Does the writer have a strong voice? Is it appropriate, consistent, and effective? Does the writer get out of the way of the information to be delivered to the reader? Does

the writer use language honestly? Is the writer's meaning clear? Does the writer use the simplest language appropriate to the subject and the audience? Does the writer break the conventions of usage, mechanics, and spelling only to clarify meaning?

- **Process** — Has the student experienced the entire writing process from finding his or her own subject through final editing? Can the student write to discover meaning? Can the student revise to discover, explore, and clarify meaning? Does the student understand the writing process? Can the student use the writing process effectively? Will the student be able to apply the writing process to future writing tasks?

These criteria should be applied to the student's best drafts, chosen by the student at the end of the unit and presented by the student for a grade. Grading the student on her best work is another way of saying that revision is important.

Planning the Writing Curriculum

Often, writing curricula resemble a definition of history given by a struggling student. The student had made it through a frustrating semester and on the final exam was asked to define "history." The student answered, "History is one damn thing after another." Attempts at student-centered education have often become one damn activity after another. As long as the student was involved and happy, education was presumably taking place.

Yet it is possible to design a writing curriculum without imposing a rigid and arbitrary set of skills and tasks and at the same time without spawning anarchy. A sound writing curriculum should be based on two types of objectives — recurring objectives, those that can be repeated year after year, and developmental objectives, those that define lines of growth.

Psychologist Jerome Bruner has stressed the importance of the "spiral curriculum" where the student deals with the same concepts year after year although at different levels of sophistication. He writes:

> Any subject can be taught to any child in some honest form . . . it should follow that a curriculum ought to be built around the great issues, principles and values that a society deems worthy of the continual concern of its members. (1960, p. 52)

What then are the continual concerns when it comes to a writing curriculum?

The qualities of good writing should be stressed year after year. The concept of focus, for example, is one that should be regularly stressed. The young child may struggle with focus when shifting from sprawling narratives (that may roam several galaxies) to narratives limited to specific incidents. The high school student may deal with focus while attempting to limit the scope of a term paper. The kinds of concerns listed in Murray's evaluation sheet are constant preoccupations for the writer. They are never mastered "once and for all." They should be central to any course that requires writing — no matter what the grade level.

Students should repeatedly work to achieve different aims in their writing. The basic aims for writing might be defined as:

Expressive: language close to the self, used to convey emotion and to explore experience and information (journals, free writing, many first drafts, learning logs)

Persuasive: language to change or confirm a belief of the reader, to move the reader to action (editorials, advertisements)

Informative: language to convey facts, observations, perceptions, concepts (news reports, interviews, research papers)

Literary: language to entertain (short stories, plays, poems, anecdotes)

These aims do not exist in pure forms. Persuasive essays, for example, usually convey both information and emotional attitudes of the writer. Most writing does, however, have a primary aim, with the other aims subordinate to that primary aim. The most thorough discussion of aims can be found in James Kinneavy's *A Theory of Discourse* (1971).

A third kind of recurring element is mode of thought. Modes of thought are variously defined but usually include narration, description, analysis of cause and effect, comparison/contrast, definition, and classification. These might be thought of as means of helping the writer achieve his aims. A writer might argue against compulsory education, for example, by describing a secondary school where students are just passing time. Or he might contrast that

type of school with private schools where students have a choice about attending. Or he can argue that once students attain "literacy" they should not be required to attend school; in that case the writer would need to define "literacy."

Besides the recurring attention to standards, to aims, and to modes, a curriculum should define lines of development, not so specifically that each student at each grade should be expected to meet the same goals . . . but so that teachers have a clear idea of the changes they seek to promote.

The modes can also be turned into questions:

What happened to X? (narration)
What did X look/feel/smell/sound/taste like? (description)
What is the difference between X and Y? (comparison/contrast)
What do you mean by X? (definition)
What caused X? (cause-effect)
What will be the results of X? (cause-effect)
What types or groups can X be divided into? (classification) (Berke, 1976, pp. 19-21)

These questions can be used in conferences and workshops to help students develop their work.

Besides the recurring attention to standards, to aims, and to modes, a curriculum should define lines of development, not so specifically that each student at each grade should be expected to meet the same goals — students don't develop in lockstep fashion — but so that teachers have a clear idea of the changes they seek to promote. What follows is a brief outline of several major lines of development.

- *From story to plot.* The novelist, E.M. Forster, distinguishes between story and plot as follows:

> . . . a story (is) a narrative of events, the emphasis on time-sequence. A plot is also a narrative of events, the emphasis falling on causality. "The king died and the queen died" is a story. "The king died and then the queen died of grief" is a plot. The time sequence is preserved, but the sense of causality overshadows it . . . If it is a story, we say, "And then?" If it is a plot, we ask, "Why?" (1927, p. 86)

Young children string together their stories with "and then"; there is little sense of logical development. In a detective story the crime is often solved not by the methodical examination of leads, but because the detective accidentally bumps into the criminal, who then confesses. As the child matures, she is capable of exploring the motivation of characters and the logic of plot.

- *From stringing a narrative to shaping a narrative.* The young writer, when recounting an event, often gives everything the same weight. The narrative is a string of beads that are all the same size. The writer, in an account of climbing Mt. Washington, will spend as much time describing what he ate for breakfast as he will describing the view from the summit. As the student matures he should be encouraged to shape the narrative, to feel free to compress long stretches of time into single sentences, and to expand important moments into several. The student eventually is able to control the movement of time in a narrative and thus control the shape of the narrative.

- *From narrative to non-narrative modes.* The young writer is often limited to the narrative mode, which fits most easily the sequence of experience. When the student experiments with other modes, where an intellectual order must be imposed on experience, she often has difficulty. These failures, though, are critically important if the student is to grow, and signs of disorder often indicate active engagement with new ideas and new forms. By the same token, a lack of disorder could indicate that the student has found a comfortable formula that actually inhibits creative thought.

- *From writing for an intimate audience to writing for a wider, unknown audience.* The young writer often writes with the belief that the reader knows and cares about her. The following piece, written by an eleven-year-old, is a charming and (for the writer) a successful account of an experience. The writer does, however, require the reader to fill in missing information.

> *Once when I went horse riding about three or four weeks back up at Morwich house on York Road. I was on a horse called Sweet William going round a field there, a man was holding*

the reins because I never rode a horse before. Then a boy, William Kemp took the reins, the horse bit him and the horse went off cantering and then started galloping for a bit bucked me about four times. I went flying and landed on my side. I thought I had broken my legs again so I started to cry, but not for long. I went up to the fencing for a rest. The man said "I was very good for staying on so long." When I had had my rest the man brought a lovely white stallion, much bigger than me, called Cobweb. I got on it and the man said, "Are you feeling better now." I said "yes" After when we had payed and were on the way home still limping on my right leg.

I said that I was glad the horse bucked me because I was glad to be on the White Stallion because the White Stallion was the most beautiful horse I had ever seen. The man said that it was his own horse and that knowbody went on it only me at that time.

The writer assumes her reader knows about her previous broken leg and assumes the reader knows where York Road is. She assumes that by calling the horse the "most beautiful" she'd ever seen, the reader knows what the horse looks like, and she assumes that we don't want to know what happened to William Kemp's hand. She assumes the reader knows the identity of the "we" at the end of the first paragraph. As writers mature they can go outside their own perspective and anticipate better the information needs of a wider audience.

- *From random rewriting to revising.* Lucy Calkins has defined stages of revision through which writers seem to pass (1980). The "random drafters" do not revise in any real sense. When a paper is finished, it is finished. They move on to the next draft without looking back to consider what they have done. The "refiners," the second group she notes, do look back at their work but only to make minor changes — a misspelling corrected, a detail added, a phrase reworded. They are unable to see major alternatives.

  Next, Calkins defines a group in transition. No longer content to simply tinker like the refiners, this group sees real weaknesses in their writing but feels inadequate to make the major changes. It is as if their critical abilities have outrun their composing abilities, and they feel very frustrated.

  Fortunately, those in the transition stage usually pass into the final stage and become "interactors." These writers can experiment with an evolving draft, exploring different points of view, different plans of organization, different relationships with the intended audience.

- *From over- and undergeneralizing to movement among the levels of generalization.* (See especially Moffett, 1968, and Britton et al., 1975). Young writers often confine themselves to accounts of specific events — for example, an account of having to stay after school — or to wide generalities — "Teachers don't care about students." They alternate between the specific and the global. As they mature, they are able to formulate middle-level generalizations that truly fit the specific information — "Teachers who must deal with 150 students and handle administrative work will often deal unjustly with students."

  Growth should not be thought of as the ability to think more abstractly, but as the ability to move among levels. George Orwell demonstrated this movement in his essay, "Politics and the English Language." Early in the essay he writes:

  > . . . an effect can become a cause, reinforcing the original cause and producing the same effect in an intensified form, and so on indefinitely.

  This sentence is heavy going. But Orwell does not leave us floating in the clouds. His next sentence:

  > A man may drink because he feels himself to be a failure, and then fail all the more completely because he drinks. (p. 355)

  The message is clear.

- *From the passive acceptance of values to informed commitment.* As the student matures, he comes to question truths that before had seemed self-evident, and an age of skepticism begins. The adolescent begins to see the contradictions (often viewed as hypocrisies) in his society. Author William Golding recounts an argument he had with a pious Methodist girl when he had reached this stage. In trying to convert him, she mentioned that there were millions of Methodists and they couldn't all be wrong:

> That was too easy . . . and I said, restively, [that] there were more Roman Catholics than Methodists anyway; and they couldn't all be wrong, could they — not all those hundreds of millions? An awful flicker of doubt appeared in her eyes.

But Golding admits that this skepticism, while necessary, is a retreat from responsibility; it destroys without having the power to create. For the skeptic, the question, "What is truth?" is always the end to the argument. For the true thinker, it is the beginning. The true thinker asks, "What is truth?" and sets out to find it. (Golding's essay is available in Muscatine and Griffith, 1980; a more thorough discussion of this type of growth can be found in Perry, 1970.)

I have tried to put forward a view of the learner as an experimenter, as someone who must be given the right to fail. Experimenting, working through a range of options, failing, failing again, finally making progress — this is what we all do when we learn, but it is too rarely what students do when they are taught to write. Too often students are put in the position of a chemistry student, later a famous scientist, who was required to take an undergraduate chemistry lab. The student would consistently work out different procedures for conducting the assigned experiments. At first the instructor tried to be genial but finally shouted, "There will be no experimenting in this laboratory!"

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Teaching the Mechanical Conventions of Writing

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Editors' Note: *In this paper Vivian Davis provides an overview of perspectives on and some specific approaches to teaching the more mechanical skills of writing. She emphasizes in her introduction that these mechanical skills are important but should not be the focus of writing instruction. Given a general emphasis on meaningful writing and a focus on conveying meaning clearly, it appears that students generally do need instruction focused on handwriting and spelling. In addition specific exercises focused on capitalization, punctuation, grammar, and usage are sometimes useful. The approaches discussed in this paper provide examples but are not presented as the best or only way to teach these skills. Effective teachers develop approaches suited to themselves and their students.*

Writing is a complex of many skills brought together and produced by the writer as a kind of "print-out" of socially agreed-upon symbols. The symbols are letters, marks, and spatial arrangements. Educated society expects the writer to adhere to certain rules and traditions about the ways the symbols are to be used. In many cases, however, those rules and traditions are arbitrary. In other cases there are so many exceptions to the rules and traditions that the writer becomes confused. To further complicate matters, the rules and traditions are not stable — they change. The skills necessary to make effective use of the symbol code are called mechanics, or mechanical skills, or mechanical conventions.

Traditionally, on the theory that following prescribed rules leads to improved writing, the mechanics have been the focus of writing instruction. Such an approach, however, ignores the writing process and the fundamental relationship between thinking and writing. Currently, many writing teachers seem to realize that while mechanics significantly affect writing, they properly are taught as part of a complex of skills that enable writers to express their ideas effectively. A large segment of the lay public, however, including educators not trained in the teaching of writing, continues to assume that mastery of mechanical skills leads to improvement of writing. Based on that assumption, particularly in this back-to-the-basics era, some schools are demanding a strong emphasis on teaching the mechanics. The teacher's problem becomes determining how to teach the mechanics as they properly relate to the whole writing process, rather than as an end in themselves.

There is little disagreement about what should be included in the teaching of the mechanical conventions of writing. Spelling, punctuation, capitalization, and grammar are included on any list compiled by experts as well as by lay people. Sometimes grammar is distin-

guished from usage, and sometimes handwriting is included. This paper will discuss briefly approaches to and practices for the teaching of handwriting, spelling, capitalization, punctuation, and grammar and usage. As each of these aspects of mechanics is considered, relevant research about teaching the skill will be discussed, and brief suggestions for instruction will be presented. The reader is reminded that there has been relatively little research on these subjects. Unless specifically stated as the results of research or study, the lists, sequences, and suggestions represent the best opinion of the persons referenced. Such non-research-based material is provided because it is the best available, and because it may provide some guidance. The chapter ends with suggestions about the role of the community in helping students learn to write.

Handwriting

Legible handwriting is essential to students' success in writing, at least until small computers are readily available free to everyone. Children need to learn how to write with ease and with enough speed that handwriting does not become frustrating or problematic to the expression of ideas. They should also be able to form letters with enough clarity that the reader can read easily for content.

Drilling children in a specific style of handwriting is not recommended as an approach to the teaching of penmanship. Children may be required to reproduce models until they have developed the ability to write letters, figures, and words unconsciously. At that point they will have begun to develop their own styles. Teachers should be alert to problem areas in the learning of handwriting — certain letters are difficult for many children, and individual children may experience specific problems with learning to write legibly. The teaching of handwriting needs to be individualized so that all children have the opportunity to master handwriting skills early in their writing experience. They will then be able to turn their attention to other phases of the writing process.

Shane and Mulry, in their review of research on the teaching of handwriting from grades three through six (Shane, Walden, and Green, 1971), report that the rate of handwriting is more closely related to quality of instruction, duration of practice, and traits of the writer than to a particular style of handwriting. They also point out that fluency in handwriting, like other skills, indicates high automatization of the skill. These authors also report a study of personal handwriting habits of sixth, seventh, eighth, and ninth-grade students. The study, completed by Seifert, showed that one third of the students at each grade level had developed their own personal handwriting styles. More than half the students studied believed their own personal handwriting styles were faster and easier for them to use than some style they were required to copy (Shane, Walden, and Green, 1971).

Generally, handwriting should be well developed by the junior high years. However, for a number of students this is not true; consequently, instruction, but more probably increased practice, must continue into junior high school and high school for some students. Shaughnessy (1977), studying the writing skills of inexperienced writers at the college level, found poor handwriting a significant problem, because difficulty with reproducing the written symbols can interfere with the composing process.

Spelling

A wide range of spelling ability exists at all levels. Some children are good spellers by the time they come to school. On the other hand, Shaughnessy (1977) found that the inability to spell correctly greatly hampered inexperienced writers at the college level. Mellon's review of data from the National Assessment of Writing (1975) indicates that spelling errors decreased by one half in each of the four-year periods tested. That is, the average number of spelling errors per 100 words of writing for nine year olds was eight; by thirteen years of age the average number of errors was four; and by seventeen years the average number of spelling errors per 100 words of writing was two. These findings imply the effectiveness of spelling instruction throughout the school experience. The findings also suggest that spelling instruction should begin in the early elementary grades and continue through high school for some students.

Allred (1977) believes that formal spelling instruction should not be undertaken with young children until they have satisfied "basic readiness criteria." To begin earlier may cause the children to experience frustration and lack of success that could lead to negative attitudes about spelling and writing. Read, Allred, and Baird (Allred, 1977) developed the following list of abilities that they believe young children should have before being required to study spelling formally:

1. Have the ability to write and name all the letters of the alphabet correctly.
2. Be able to copy words correctly.
3. Be able to write his or her own name without copying.
4. Be reading at about a second-grade reading level or better.
5. Be able to enunciate words clearly.
6. See that words are composed of different letters.
7. Have a beginning phonetic sense and recognize the common letter-sound combinations.
8. Be able to write a few simple words from memory.
9. Ask for words he or she is in doubt about and be able to express a few thoughts in writing.
10. Demonstrate a desire and interest in learning to spell. (p. 20)

For the most part, spelling instruction should follow the same general pattern throughout the grades. Research indicates that the test-study-test method is the most effective means of teaching spelling. Though much spelling is learned incidentally outside the classroom and from the context of reading, research shows that more learning takes place when specific lists are presented and conscious instruction takes place. Because there is a wide range of spelling ability at every grade level, Fitzgerald (1951) recommends that a pretest be given at the beginning of the school year covering all the words to be mastered that year. Test results will indicate to the teacher the kinds of spelling problems the whole class will face. Perhaps most important, the test will alert each student to the words he or she needs to work on during the year.

Fitzgerald suggests that after the pretest results have been analyzed spelling instruction be individualized, with weekly spelling lists being drawn from a core of words that includes words the children need in their own writing. Instruction would include a weekly pretest.

There is some controversy in the literature about the words students should learn to spell. Allred (1977) points out that Horn has developed comprehensive lists of words that children need to be able to spell and lists of words that adults need to be able to spell. Like Fitzgerald, Horn suggests that the words presented for spelling instruction be those that students will use in their own work.

Fitzgerald suggests that children be taught a five-step process by which they can effectively learn how to spell:

1. *Meaning and pronunciation.* Look at the word. Pronounce the word. Use the word correctly in a sentence.
2. *Imagery.* See and say the word. See the syllables of the word. Say the word, syllable by syllable. Spell the word.
3. *Recall.* Look at the word. Close your eyes and spell it. Check to see whether your spelling is correct. (In case you made an error, do steps 1, 2, and 3 again.)
4. *Writing the word.* Write the word correctly. Dot the i's. Cross the t's. Close the o's. Check your writing to see that every letter is legible. Check your spelling.
5. *Mastery.* Cover the word and write it. If it is correct, cover the word and write it again. If it is correct, cover it and write it once more.

   If you made a mistake, do all the steps over again until you learn to spell the word. (p. 38)

Some variation of this process is recommended at all grade levels. It is essential that students understand the meanings and pronunciations of words they are learning to spell. Beyond simply spelling the words, students need to be able to use the words in their own speech and writing.

Teaching spelling rules is less helpful than leading students to deduct common patterns in the spelling of a variety of words. Allred (1977) suggests that young children be taught only those rules that have few or no exceptions; that one rule be taught at a time; that rules be taught only when there is need of them; and that there be ample reviews of rules both in the grades where the rules are taught and in subsequent grades. Current research (Loban et al., 1969) indicates that knowing a particular rule can pro-

vide a clue to spelling a certain word, but rules can be frustrating and obstructive when they are so complex as to be confusing. The best practice strikes a medium between teaching so many rules that they become burdensome, and teaching enough rules to provide guidance. Rules should never be taught abstractly without examples for application (Allred, 1977, p. 27).

The most recommended methods for teaching spelling are test-study-test; self-corrected tests that allow students to spell the word and receive feedback immediately so that they can correct any spelling errors just after writing the word; and individualized instruction that allows students to find out what words they need to learn to spell and gives the teacher opportunity to help students move along at their own pace (Petty, 1968; Allred, 1977; Sherwin, 1973). The class should be organized to accommodate group instruction, peer teamwork, and individual study. New material can be presented to and discussed with the whole class. Pretesting at the beginning of the year and posttesting at the end of the year can be administered to the entire class. During the year, pretests and posttests for weekly spelling lists should be administered to small groups or individuals in the class depending on the different levels of progress. Peers can work together to dictate the tests and to study spelling.

Editing and revising are essential to helping students find and correct their own misspellings. The real test of spelling is the student's own writing.

Researchers and experienced practitioners agree that the most significant thing teachers can do to help students improve their spelling is to lead them in the development of "spelling consciousness." If students learn to use the dictionary, to enjoy knowing words and using them in their own writing, they will be motivated to learn how to spell.

It is important that spelling instruction not degenerate to drill work or to filling in blanks in workbooks. Both dictation drills and carefully prescribed workbook exercises may be useful for individual students from time to time, depending on their spelling problems. Editing and revising are essential to helping students find and correct their own misspellings. The real test of spelling is the student's own writing. Fitzgerald (1951) points to the existence of standardized spelling tests but warns that such scales are useless if they are not composed of words students need to spell in their own work.

Capitalization

Mellon's review of the National Assessment of Writing (1975) shows that, on the average, one capitalization error appears per 100 words of writing at age nine, and that that average continues at ages thirteen and seventeen. Shaughnessy (1977) found a superfluity of capital letters in the work of inexperienced writers at the college level. She believed the practice followed the idiosyncrasies of individual students rather than any logic or rules. Loban, Ryan, and Squire (1969) suggest that instruction in capitalization continue through secondary school. According to these writers, "errors in capitalization of proper nouns account for a large percentage of mechanical problems. Frequent capitalization errors at the beginning of sentences result from lack of sentence sense rather than misunderstanding of the need for initial capitalization" (p. 108). They suggest the need to stress the difference between common and proper nouns and to concentrate on exercises that will help students intuit sentence completeness.

Petty (1968), considering the variation in student abilities as well as the need for certain kinds of capitalization at different grade levels, has compiled a list of suggested objectives that may be used for the teaching of capitalization from first through sixth grades. While a teacher may not find it possible or desirable to follow Petty's suggestions to the letter, every teacher, throughout the grade levels, ought to define specific objectives that insure the teaching and reinforcing of capitalization as a part of instruction in the whole writing process.

Grade One:
1. The first word in a sentence.
2. The child's name.
3. The pronoun "I."
4. The names of his or her teachers, school, town, etc.

Grade Two:
1. Names of days and months.
2. Names of titles — Mr., Mrs., Miss
3. Proper names used in daily writing.
4. First and important words in titles of books and stories.

Grade Three:
1. First word in a line of verse.
2. First word of salutation, as "Dear," and of closing, as "Yours."
3. Names of holidays.

Grade Four:
1. Names of cities and states and other geographical names.
2. "Mother" and "Father" when used in place of the name.
3. Names of organizations, as Boy Scouts, Grade Four, and so forth.

Grade Five:
1. Names of all places and persons, countries, oceans, and so forth.
2. Capitalization necessary in outlining.
3. Titles when used with names, such as President Lincoln.
4. Commercial trade names.

Grade Six:
1. First word of a quoted sentence.
2. Proper adjectives, showing race, nationality, and so forth.
3. The Bible and names for the Deity.
4. Abbreviations of proper nouns and titles. (p. 73)

Instruction in capitalization can be individualized through pretesting. Experienced practitioners suggest that capitalization is learned best in relationship to the student's own writing. Students should learn rules as they are needed and should be given practice exercises in applying the rules. Student discussion of the uses of capitalization helps them clarify the rules for themselves and helps the teacher decide what instruction may be necessary.

Students should work in small groups or teams with dictation exercises primarily based on their own writing. Appropriate instruction in capitalization should precede writing assignments to reinforce the relationship between the expression of ideas in writing and the technical conventions of the written code. Time should always be allowed for student editing and revision of their written work. Students should be able to refer to the teacher and resource materials if they are confused about any capitalization items as they write. Capitalization should be reviewed at any grade level where student writing indicates the need. Loban, Ryan, and Squire (1969) suggest having secondary students study the writing of professionals to increase consciousness about the accepted uses of capitalization.

Punctuation

Punctuation, according to Corbin, "is a set of special symbols that we use to show in writing what we would indicate quite naturally in speaking by facial expression, body gesture, or volume and tone of voice" (1966, p. 36). Rules for punctuation are extremely complicated, and dependence on oral expression only for guidance in punctuation can lead to confusion and frustration. Mellon (1975) reports that data from the National Assessment of Writing indicate that at age nine, children show two punctuation errors for every 100 words of writing, but the number of errors increases to three at ages thirteen and seventeen. Mellon explains that as student writing "grows more syntactically complex ... errors of punctuation are bound to occur ..." (p. 32). This fact indicates the need for a systematic approach to the teaching of punctuation from the early elementary grades through secondary school. Shaughnessy (1977) found that lack of punctuation skills limits writing development for many college students.

In the elementary grades, the focus is on teaching the basic punctuation code and helping children to become conscious of the exceptions as well as the rules that govern the use of punctuation. At the secondary level, students should review these rules and learn more about the rhetorical uses of punctuation and how to make judgments about the use of various punctuation marks. At both levels learning is best accomplished when students have a clear understanding of what is being taught. The well-trained teacher can judge the levels of the students' understanding by their written work and by their participation in the class discussion — particularly the questions they ask.

Punctuation, like the other mechanical conventions, cannot be taught at only one grade level in the student's experience. The rules are best learned inductively, and students need

to use their own writing to reinforce what they learn about how to punctuate.

Petty (1968) outlines punctuation objectives for elementary grade levels. The list illustrates one method that teachers may use to be certain that punctuation instruction extends throughout the entire elementary school experience. Regardless of order or pacing of punctuation instruction, it is necessary to review and reinforce previous instruction each year in new contexts.

Grade One:
1. Period at the end of a declarative sentence.
2. Period after the numerals in a listing.

Grade Two:
1. Question mark at the end of a question.
2. Comma after the salutation in a friendly letter.
3. Comma after the closing in a friendly letter.
4. Comma between the day of the month and the year in the writing of a date.
5. Comma between the name of a city and the name of a state when written together.

Grade Three:
1. Period after an abbreviation or initial.
2. Apostrophe in common contractions, such as isn't, aren't, I'll.
3. Commas between words in a list.

Grade Four:
1. Apostrophe in words to show possession.
2. Exclamation point at the end of an exclamatory statement.
3. Period following a command.
4. Commas setting off appositives.
5. Colon after the salutation of a business letter.
6. Quotation marks around direct quotations.
7. Comma between explanatory words and a quotation.
8. Periods after numbers or letters in an outline.
9. Hyphen showing division of a word at the end of a line.

Grade Five:
1. Colon in writing time, as 8:40.
2. Comma to show changed word order.
3. Underlining the title of a book.
4. Quotation marks around the titles of booklets, pamphlets, poems, stories, and the name of a chapter in a book.

Grade Six:
1. Commas setting off nouns in direct address.
2. Colon at the beginning of a list.
3. Hyphen in compound numbers.
4. Commas in sentences as needed to make meaning clear. (pp. 73-74)

Students should be given diagnostic tests to determine what items of punctuation need to be taught to the entire class or to individuals. Helping students to develop an intuitive understanding of the written sentence is basic to the teaching of punctuation. Dictation exercises requiring students to punctuate help to reinforce the rules. Care should be taken that dictation exercises reinforce the correct use of punctuation that students have already learned. Discussion of punctuation rules is important because students often make generalizations from patterns they observe that serve only to confuse them later. Students should check their own work and correct their own errors as well as ask questions for clarification just after taking the dictation. Time should be allowed for discussion of items that have a number of variations.

Frequent short punctuation drills, both oral and written, are preferred to the teaching of rules, although some teachers and students find that rules are helpful when used with drills. Students should work in small groups or teams on the aspects of punctuation that they have not yet mastered.

Students should be taught how punctuation attempts to reproduce features of spoken language. They should be taught how to proofread and should always be required to do so. They should be given time to edit and to revise their written work. Students at the secondary level should be made aware of how the rules of punctuation can be used to make rhetorical choices in writing. This can be accomplished through conscious analysis of literature and popular writing and through opportunities to practice the rhetorical uses of punctuation.

In general, punctuation should be presented in such a way that students feel they are in control of it, rather than feeling that their writing is inhibited by a complicated maze of rules.

Grammar and Usage

Grammar and usage are often considered part of what is now called the study of language. According to Corbin (1966), grammar "deals with the predictable structures and word forms that characterize our language, spoken or written" (p. 38). Generally, it may be said that grammar is the means by which the different elements of our language can be put together in groups of sounds or written symbols so that ideas, feelings, and images can be communicated. For example, it is grammatically incorrect to say or write "A chocolate me baked she cake," because the words are strung together in such a way that they convey no meaning. Put into a grammatical sequence, the string of words would read, "She baked me a chocolate cake." All speakers of English recognize the difference between a grammatical and an ungrammatical utterance or written sentence, but most of us do not consciously think of the rules we must use to make our sentences or spoken words have meaning. Nonetheless, we use the rules of grammar each time we speak or write. We use certain rules to ask questions, to show emotions, to state facts. These rules and the patterns they engender in language are the grammar of the language.

On the other hand, we must abide by a set of language rules other than the rules of grammar if we are to be accepted as proper speakers and writers in certain social settings. This set of rules is referred to as "usage rules." Usage rules are often confused with grammar rules to the extent that we commonly refer to usage as grammar. For example, it is grammatical to say or write "This ain't the book y'all was readin'," because the words are put together in such fashion that any English speaker understands the intended meaning. The sentence, "This ain't the book y'all was readin'," when judged by the standard usage rules, is not an example of "proper" English usage. English usage has a great deal to do with one's ethnicity and social class as well as with the particular dialect of English one has learned to speak.

Normal children come to school already understanding how to use spoken language. This means that they already know the grammar of language — that is, the rules by which the language carries meaning. They do not, however, know grammar theories or terminology. They are not consciously aware of what makes the language work the way it does. They are not consciously aware of what makes the language work the way it does. On the other hand, many children bring to school their own language or dialect, which may not be one of the variations of standard American English — the kind of English accepted in educated circles. Teachers have to be aware of language differences without making value judgments about the language of their students. There is much controversy about whether teachers should attempt to change unacceptable usages in their students.

It is the teacher's responsibility to help students understand the social implications of language and the need to develop flexibility in usage necessary for different social settings.

The best approach is to find out what problems the student has with making the language convey his or her message in writing, and to work with the student on solving these problems. It is the teacher's responsibility to help students understand the social implications of language and the need to develop flexibility in usage necessary for different social settings. Teachers need to select only those usage items that are essential according to language habits accepted in the community and the larger society and according to what research reveals about changes in usage. Perhaps it would be well for a school district to make known its definition of acceptable school usage from time to time. Once these determinations are made, the teacher is responsible for identifying instructional needs of students.

A communication-skills approach to the teaching of grammar and usage gives the student opportunities to learn how to use language appropriate to various situations. Rather than having students speak or write to prescriptions, the communication-skills approach urges students to strive for clarity and precision in expression of ideas, feelings, and images. The

objective is to help students learn how they can make the language work *for* them, rather than to inhibit their creativity by substituting rules and formulas for the communication of a substantive message.

Some of the grammatical problems many students experience with written English are the inability to express tense through verbs and the inability to indicate accurately the relationships between persons, between things, and between persons and things. Developing an understanding of the written sentence also presents difficulties for a great number of students, who are likely to produce sentence fragments or run-ons instead of sentences. Part of this difficulty results from their inexperience in using the grammar of written school English, which does not parallel the spoken language of anyone, including the educated. And part of the difficulty is the result of grammar instruction that focuses on rules and the use of exercises that demand editing or labeling sentences written by someone other than the student.

Goldstein (1966) believes that the study of grammar properly belongs in the junior high school. Loban, Ryan, and Squire (1969), however, believe that grammar instruction should continue through secondary school. Shaughnessy (1977) points to the need for immature college freshmen to study grammar. None of these experts recommends the formal study of any grammatical theory. Rather, they believe grammar is useful only as a tool that allows students to analyze the ways they can make sentences — particularly written sentences — work for them. Loban, Ryan, and Squire report that studies done by Ellen Frogner in 1939 indicated that instruction analyzing errors in sentence structure as problems in the thinking processes, rather than as grammar errors, produces improvement in writing.

Rather than using workbooks to teach grammar and usage, teachers are advised to develop exercises that push students to practice sentence development in their own writing. The key is to help students develop competency in writing grammatical sentences rather than providing them with prescriptions or having them analyze the writing of others. Sample exercises for sixth grade and above follow:

1. The teacher writes five sentences on the board and asks the students to rewrite each sentence, changing the tenses of all verbs in the sentences. The sentences should be from students' writing or should be of high interest to students.
2. The teacher asks students to write five sentences using certain grammatical features, such as an introductory adverbial phrase.
3. The teacher asks students to write dialogs that allow for argumentation on a particular point.
4. The teacher has students keep a notebook of sentences or statements or definitions that they like. The students are encouraged to rewrite these entries.

Teachers and students should discuss together what works and what does not work in the students' writing. Generally, when students examine their writing closely, they are able to point out errors in grammar. The need then is to have a resource on which the student can draw for improvement.

It should be pointed out here that while the study of grammar must not become bogged down in rules and prescriptions, students must learn some common terminology and gain some comprehension of language functions if the study of grammar is to be useful to them. This does not mean that students should learn the eight or nine parts of speech and parse sentences, but that language *about* language should be taught from a functional point of view.

Community Role in Teaching the Language Arts

The community should be informed and concerned about what their schools are teaching children in the language arts. As we grow to understand our interdependence, it becomes clearer that communication is crucial to our survival. The community, then, should be commited to supporting useful language studies. That kind of commitment demands objectivity and careful study of the communication needs of the whole community and, more specifically, of students. While sloganeering may call attention to problems, it does not solve them. Edu-

cators need opportunities to learn more about the ways different students can learn to use language effectively. The community needs to support inservice experiences, including conferences, workshops, and college classes, that will help educators increase their knowledge about and skills in teaching the language arts. The schools also need the freedom to arrange class time and to allot teaching personnel so that individualized instruction is maximized. The community should support the move toward individualized instruction, not as a fad, but as a lasting, effective educational practice.

Mechanical conventions are the least creative component of the writing process, but they are easily spotted by parents and members of the community who have had their consciousness heightened by English teachers somewhere in their own school experience. As Mauree Applegate pointed out over twenty years ago, "Excellence in a paper is never mere . . . mechanics; it is the vital essence of the . . . writing on that paper that is truly important (1957, p. 39).

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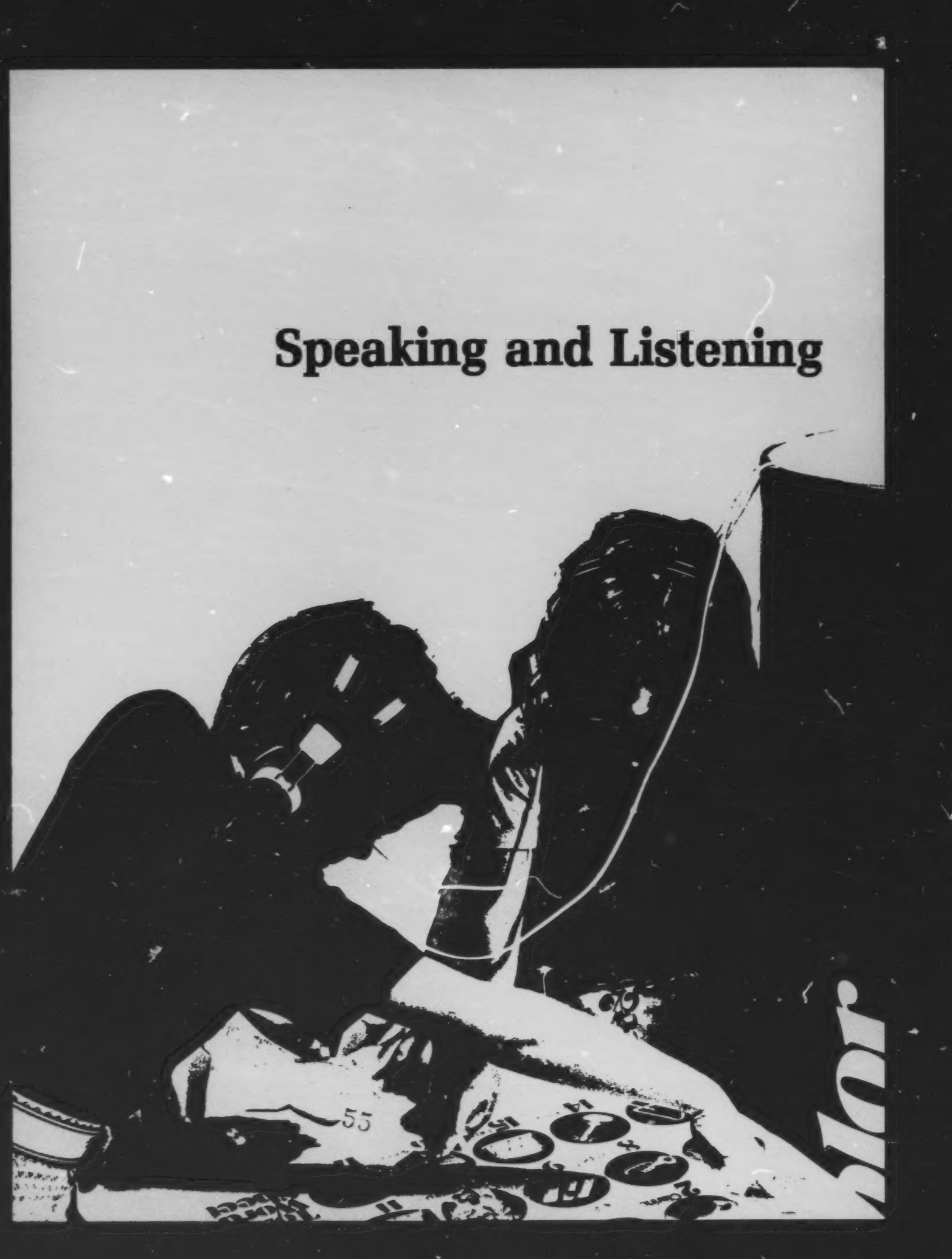
Speaking and Listening



Overview: *Oral communication is being increasingly emphasized in basic skills instruction. Parents and teachers are recognizing that effective oral communication skills are needed for success in most situations — in work, in families, in friendships, and in school. The four papers in this section present background on the importance of oral communication and on approaches to oral communication instruction. Oral communication is presented here as a complex set of skills on which students need specific help. In the first paper Barbara Lieb-Brilhart presents the background, content, and implications of the statement of standards for oral instruction prepared by professional associations. That paper discusses some of the contrasts between current instruction in many schools and the recommended best instruction. The next three papers help show how the recommendations can be carried out. Barbara Wood discusses the approach most generally accepted by the profession, the functional approach to teaching oral communication; Fred Jandt discusses several efforts to define and measure specific skills in oral communication; and Clarice Lowe suggests an approach to planning instruction around one of the skills presented in the Jandt paper.*

Standards For Effective Oral Communication Programs

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Editors' Note: *Barbara Lieb-Brilhart begins this paper with a discussion of the importance of oral communication and its place as one of the basic skills. She discusses major assumptions about basic skills instruction in oral communication and indicates some of the potential difficulties in implementing oral communication instruction. She also gives a brief account of how the "Standards for Effective Oral Communication Programs" were prepared and some ways the Standards can be used. Dr. Lieb-Brilhart was actively involved in development of the Standards and in revising them after they were reviewed by university and school district staff. The Standards are included with her paper.*

The description of the basic skills in Title II of the Elementary and Secondary Education Act (ESEA) as "reading, mathematics and effective communication, both written and oral" reflects an expanded view of what is considered basic in education. This view emerges from our knowledge that oral language skills are central to the development of other language skills and to achievement in other areas of the curriculum.

Oral communication skills are also important for the effective functioning of adults in social and career contexts. For example, the 1978 Endicott Report stated that communication was among the top three skills cited as important for success by managers in business, engineering, and the arts (Endicott, 1978). McBath and Burhans (1975) summarize several studies which support the notion that oral communication skills — including public speaking, listening, conference leadership, and other group communication skills — are among the most valued in business and industry. The Stump and Selz paper in this volume presents further evidence for this view.

The burgeoning of adult courses in areas such as "communication skills for teachers" (Lynn, 1976), family communication, and conflict resolution is reflective of the need for communication training. Also relevant is a study of 2,543 adults, 40 percent of whom selected as their major fear that of "speaking before groups" (Bruskin, 1973).

Despite the acknowledged importance of oral communication in career and personal success, only a small portion of American high school graduates has received formal instruction to help them develop effective oral communication skills. Recent data from the National Center for Educational Statistics indicate that, at best, 65 percent of senior high schools offer identifiable speech communication courses. Few of these schools require speech courses for graduation, and it is difficult to determine the degree to which speech is taught in English courses.

When available, speaking and listening instruction is usually offered through electives, which are selected largely by those students who already perform well in oral communication activities. At the elementary school level, such instruction is either fortuitous (i.e., contingent upon the teacher's training and interests) or is available primarily for students with speech pathologies or disorders. Because of the notion that written literacy should be the *primary* goal of formal education, most students with so-called normal speech development receive little *formal* training to develop oral communication skills.

Despite the acknowledged importance of oral communication in career and personal success, only a small portion of American high school graduates has received formal instruction to help them develop effective oral communication skills.

Because it includes oral communication skills in its definition of "basics," the Basic Skills legislation provides educators with opportunities to integrate oral communication instruction into the curriculum. In order to help educators design appropriate oral communication instruction, this paper includes the Speech Communication Association (SCA) and the American Speech-Language-Hearing Association's (ASHA) *Standards for Effective Oral Communication Programs* and describes those assumptions which must be understood when implementing them.

The *Standards* were drafted by staff members of SCA and ASHA in February 1979. The document was reviewed by several boards of both organizations, including ASHA's Task Force on Basic Skills. Members of the National Council of Teachers of English (NCTE) Ad Hoc Committee on Standards for Basic Skills Writing Programs also offered suggestions for revisions. All of the suggestions for modification were then incorporated into the final document by Stanley Dublinske, then director of ASHA's School Services Program, and this writer, who was then SCA's Associate Executive Secretary for Education and Research. The final document was approved for publication in April 1979 by appropriate officials in both SCA and ASHA.

When the SCA/ASHA standards are compared with those of NCTE for writing programs (included in Charles Suhor's paper), it is clear that there are parallel issues and concerns in the two documents. However, there are also distinct differences between oral and written communication which must be understood by teachers. These differences and other concepts are embodied in the three assumptions which underly the *Standards*.

Assumption 1: Oral communication instruction is critical in the teaching of reading and writing skills and the content areas. Both empirical research and instructional experience support the notion that speaking and listening skills are central to the acquisition of other learning. Moreover, educators increasingly support the notion that language development is influenced by experiences and learning in reading, writing, and oral communication and that these integrated processes should be reflected in communication instruction.

Assumption 2: Oral communication is worthy of instruction for its own sake. While many teachers readily accept the first assumption, there is less awareness of the need to provide oral communication instruction apart from its role in developing written communication skills. A myth that persists is that because the written code is a new "language" that must be taught, and because most children already enter school using the oral code, there is no need for further education in the skills of speaking and listening. A related myth is that "anyone can teach oral communication." While there have always been qualified, certified teachers for speech electives, language arts and English instruction has often been the responsibility of teachers with little or no training in oral communication.

An SCA project reported elsewhere in this volume (see Barbara Wood's paper) studied the development of communication competence. Findings indicated that children need continu-

ous help throughout their schooling in order to develop a repertoire of communication behaviors for functional purposes. The fact is that many children and adults have failed to develop many of the verbal and non-verbal skills which are critical in human interactions. Teachers trained to understand and to facilitate communication development could significantly improve these skills.

Assumption 3: Including language arts activities in classroom instruction does not ensure learning of communication skills. Some of the best elementary school teachers will describe their oral language activities as "listening to stories and reports," "reading aloud," "sharing time," and so on. While these activities are useful in developing some critical language skills (e.g., recall of information, vocabulary, and expressive skills), they do not go far enough in developing the communication skills of interaction. Interaction is a fluid process where speaker/listener roles are constantly changing and where messages are continuously modified on the basis of our own and others' perceptions, moods, and responses of the moment. Developing communication skills involves a focus on speaker/listener interaction.

Bader (1975), in summarizing the work in social perception and learning disabilities, describes the importance of developing children's abilities to recognize and respond appropriately to the attitudes of others. Such abilities differ widely among speakers of the same language. The *Standards* emphasize the interactive nature of speaking and listening and the notion that communication competence is not entirely dependent upon use of a particular form of language but upon the use of a variety of other skills as well.

While children should engage in a wide range of speaking and listening experiences, such as those described in the *Standards*, such "exposure" is not enough. As the child moves through the curriculum, teachers must teach the principles of effective communication directly. Hence, there are standards which emphasize the notion that "oral communication behaviors can be improved through direct instruction" and that "individuals responsible for oral communication instruction [should] receive continuing education on theories, research, and instruction relevant to communication."

In implementing the *Standards for Effective Oral Communication Programs*, the professional community is likely to experience some tensions:

The tension between the functional view of communication and the notion of speech arts. The *Standards* emphasize the everyday needs of students, the classroom as a practical communication environment, and the expansion of a repertoire of effective speaking and listening behaviors (this functional approach is described by Barbara Wood in her paper). However, there will be some who argue that the primary goal of the oral communication curriculum is to perfect speaking as an art form in formal activities such as drama, debate, public speaking, and oral interpretation. The fifth standard in the "Teaching/Learning" section attempts to resolve the tension by indicating that all students should have experience in both informal and formal activities for a broad range of purposes.

. . . oral communication instruction should be systematically related to the other communication areas. However, there must also be a place in the elementary school curriculum where oral communication processes are taught directly and explicitly (just as we teach reading, mathematics, and science).

The tension between oral communication instruction as an identifiable part of the curriculum and as a vehicle to learning in all areas of the curriculum. Underlying the *Standards* is the belief that all teachers should utilize oral communication activities in the teaching and learning process. Furthermore, as the second standard under "Teaching/Learning" indicates, instruction should be systematically related to the other communication areas. However, there must also be a place in the elementary school curriculum where oral communication processes are taught directly and explicitly (just as we teach reading, mathematics, and science). In

the secondary school *each* student should experience courses or units which are devoted to the development of oral communication skills. Instruction should not be reserved only for those with highly developed abilities. In addition, oral communication instruction should be integrated with instruction in reading and writing and across other areas of the curriculum.

The tension between the notion that all teachers are responsible for oral communication instruction and the notion that specialists should bear the major responsibility. The *Standards* state that "oral communication instruction is provided by individuals adequately trained ... as evidenced by appropriate certification." This means that all elementary school teachers who have responsibility for language arts instruction should be trained in language and communication development and should demonstrate competence in their own communication abilities. They should also be able to identify students with communication disorders and refer them, when necessary, to specialists who deal with such disorders. Specialists are currently available, but in too few numbers, in most school districts.

At the secondary school level, there are speech teachers who teach courses in speech communication, theatre, or debate. In many states, however, English teachers who may have had no preparation or as few as three credits in speech are responsible for oral communication instruction. For guidance in improving the competence of teachers in oral communication, SCA has published guidelines for preparing all teachers and for preparing elementary teachers and secondary school teachers of speech communication, debate, theatre, and mass communication (SCA and ATA, 1978). Effective oral communication programs will provide in-service training for all teachers, but they will also ensure that, whenever possible, specialists provide the primary instruction and assist others in utilizing oral communication as a vehicle to learning.

The tension between the desire to include oral communication in the curriculum and the difficulty of assessing oral communication skills. If speaking were merely the analogue of writing, and listening the analogue of reading, assessment would be relatively simple. For we could then evaluate speech samples apart from their responses by listeners; likewise, listening factors could be evaluated on the basis of responses to materials which are spoken or read and not as part of their function in the interactive process. However, if we view speaking and listening in a communication context, involving fluid exchanges of speaker-listener roles, it is difficult to "freeze" the process for purposes of assessment. While assessment may be difficult, it is also important that educators not use this as a reason for leaving oral communication out of the basic skills curriculum. In fact, as oral communication programs are being designed, more state and federal agencies, as well as research organizations, are developing assessment procedures. Furthermore, an SCA Task Force on Assessment has compiled listings of print and human resources and has produced the *Criteria for Evaluating Instruments and Procedures for Assessing Speaking and Listening*, which appear in Fred Jandt's paper. SCA has also published a product which describes conceptual issues involved in assessing oral communication and reviews ninety instruments or procedures which could be adapted for school use (Larson et al., 1978). Test publishers are also participating in the development of suitable instruments. Although these activities are helpful and encouraging, it is important that ease of assessment not determine the content of the curriculum.

Using the Standards

The *Standards* are organized into five sections. The first two sections provide the rationale for establishing an oral communication program. The last three sections can be used as guidelines for establishing programs, for deciding what should be included in them, and for evaluating them.

The *Definition* describes a view of communication which emphasizes *interactive behaviors*, including listening and speaking and verbal and non-verbal behaviors in a variety of social situations. Speaking and listening are described as a complex of many specific behaviors.

The *Basic Assumptions* may seem at first glance like common sense statements. Although

they represent beliefs which are widely held by oral communication professionals and which are supported by research and teaching experience, they may be very new to other educators. It is highly recommended that teachers receive inservice training to understand the bases for these beliefs.

Sections on *Teaching/Learning* and *Support* describe practices now evident in many high schools and, more frequently, in two- and four-year higher education institutions. While few programs in elementary schools exhibit these characteristics, they could easily be incorporated by teachers trained in oral communication (see Barbara Wood's paper for initial guidance).

The section on *Assessment and Evaluation* represents goals toward which schools should strive. These standards are discussed further in Fred Jandt's paper.

Clearly, for schools just building an oral communication program, all these characteristics will not be present initially, but the goal should be to build a comprehensive program by the end of two or three years. The Basic Skills legislation has given elementary and secondary schools an opportunity to incorporate oral communication instruction into their curricula. The SCA and ASHA *Standards for Effective Oral Communication Programs* offer guidelines for doing so. It is important that we seize this opportunity — to do so is to increase our students' chances for academic and personal success.

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Standards for Effective Oral Communication Programs

Prepared by
American Speech-Language-Hearing Association
and
Speech Communication Association

Adequate oral communication frequently determines an individual's educational, social and vocational success. Yet, American education has typically neglected formal instruction in the basic skills of speaking and listening. It is important that state and local education agencies implement the most effective oral communication programs possible.

The following standards for oral communication were developed by representatives of the Speech Communication Association and the American Speech-Language-Hearing Association.

If effective oral communication programs are going to be developed, all components of the recommended standards must be considered. Implementation of these standards will facilitate development of adequate and appropriate oral communication necessary for educational, social and vocational success.

Definition

Oral Communication: the process of interacting through heard and spoken messages in a variety of situations.

Effective oral communication is a learned behavior, involving the following processes:

1. Speaking in a variety of educational and social situations: Speaking involves, but is not limited to, arranging and producing messages through the use of voice, articulation, vocabulary, syntax and non-verbal cues (e.g., gesture, facial expression, vocal cues) appropriate to the speaker and listeners.
2. Listening in a variety of educational and social situations: Listening involves, but is not limited to, hearing, perceiving, discriminating, interpreting, synthesizing, evaluating, organizing and remembering information from verbal and non-verbal messages.

Basic Assumptions

1. Oral communication behaviors of students can be improved through direct instruction.
2. Oral communication instruction emphasizes the interactive nature of speaking and listening.
3. Oral communication instruction addresses the everyday communication needs of students and includes emphasis on the classroom as a practical communication environment.
4. There is a wide range of communication competence among speakers of the same language.
5. Communication competence is not dependent upon use of a particular form of language.
6. A primary goal of oral communication instruction is to increase the students' repertoire and use of effective speaking and listening behaviors.
7. Oral communication programs provide instruction based on a coordinated developmental continuum of skills, pre-school through adult.
8. Oral communication skills can be enhanced by using parents, supportive personnel, and appropriate instructional technology.

Standards for Effective Oral Communication Programs
(Continued)

An effective communication program has the following characteristics:

Teaching/Learning

1. The oral communication program is based on current theory and research in speech and language development, psycholinguistics, rhetorical and communication theory, communication disorders, speech science, and related fields of study.
2. Oral communication instruction is a clearly identifiable part of the curriculum.
3. Oral communication instruction is systematically related to reading and writing instruction and to instruction in the various content areas.
4. The relevant academic, personal and social experiences of students provide core subject matter for the oral communication program.
5. Oral communication instruction provides a wide range of speaking and listening experiences, in order to develop effective communication skills appropriate to:
   a. a range of situations; e.g., informal to formal, interpersonal to mass communication.
   b. a range of purposes; e.g., informing, learning, persuading, evaluating messages, facilitating social interaction, sharing feelings, imaginative and creative expression.
   c. a range of audiences; e.g., classmates, teachers, peers, employers, family, community.
   d. a range of communication forms; e.g., conversation, group discussion, interview, drama, debate, public speaking, oral interpretation.
   e. a range of speaking styles; impromptu, extemporaneous, and reading from manuscript.
6. The oral communication program provides class time for systematic instruction in oral communication skills, e.g., critical listening, selecting, arranging and presenting messages, giving and receiving constructive feedback, non-verbal communication, etc.
7. The oral communication program includes development of adequate and appropriate language, articulation, voice, fluency and listening skills necessary for success in educational, career and social situations through regular classroom instruction, co-curricular activities, and speech-language pathology and audiology services.
8. Oral communication program instruction encourages and provides appropriate opportunities for the reticent student (e.g., one who is excessively fearful in speaking situations) to participate more effectively in oral communication.

Support

1. Oral communication instruction is provided by individuals adequately trained in oral communication and/or communication disorders, as evidenced by appropriate certification.
2. Individuals responsible for oral communication instruction receive continuing education on theories, research and instruction relevant to communication.
3. Individuals responsible for oral communication instruction participate actively in conventions, meetings, publications, and other activities of communication professionals.

Standards for Effective Oral Communication Programs
(Continued)

4. The oral communication program includes a system for training classroom teachers to identify and refer students who do not have adequate listening and speaking skills, or are reticent, to those qualified individuals who can best meet the needs of the student through further assessment and/or instruction.
5. Teachers in all curriculum areas receive information on appropriate methods for: a) using oral communication to facilitate instruction, and b) using the subject matter to improve students' oral communication skills.
6. Parent and community groups are informed about and provided with appropriate materials for effective involvement in the oral communication program.
7. The oral communication program is facilitated by availability and use of appropriate instructional materials, equipment and facilities.

Assessment and Evaluation

1. The oral communication program is based on a school-wide assessment of the speaking and listening needs of students.
2. Speaking and listening needs of students will be determined by qualified personnel utilizing appropriate evaluation tools for the skills to be assessed, and educational levels of students being assessed.
3. Evaluation of student progress in oral communication is based upon a variety of data including observations, self-evaluation, listeners' responses to messages, and formal tests.
4. Evaluation of students' oral communication encourages, rather than discourages, students' desires to communicate by emphasizing those behaviors which students can improve, thus enhancing their ability to do so.
5. Evaluation of the total oral communication program is based on achievement of acceptable levels of oral communication skill determined by continuous monitoring of student progress in speaking and listening, use of standardized and criterion-referenced tests, audience-based rating scales, and other appropriate instruments.

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Oral Communication: Holistic Skills/Functional Approach

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Editors' Note: *After outlining five kinds of functional oral communication skills, Barbara Wood provides an overview of a functional approach to oral communication instruction. She also discusses how to plan and organize such a program. Dr. Wood notes that such instruction is intended to relate to students' current interests and to provide very practical skills. This approach is parallel to the current emphasis on meaningful or purposeful communication in writing instruction.*

Developing Communication Competencies in Children and Youth

Most schools expect their graduates to be able to fill out a job application, conduct themselves effectively in an interview, ask for help when they need it, or express sympathy to a friend who has lost a loved one. These functional language skills require competence in reading and writing, of course, but they also require competence in oral communication. Too often parents and teachers assume that, because children and youth "can talk," they are necessarily skilled in oral communication. Studies of children's communication effectiveness suggest that many children and youth lack adequate oral communication skills; in fact, many are reticent to speak in important communication contexts (Garrison and Garrison, 1979). If the goal of language arts instruction in the schools is the development of functional communication skills in students, then effective development of oral skills — speaking and listening — must carry weight in such a program.

This paper presents an approach to oral language development of children and youth that incorporates a functional view of communication centering on five critical functions of everyday interactions: controlling, sharing feelings, informing (and responding), ritualizing, and imagining. These communication functions are taught according to an instructional process which stresses the development in children of a repertoire of communication strategies, the development of selection criteria for choosing the most effective and appropriate strategies, practice in implementing communication choices, and the development of methods that children can use to evaluate their communication.

Content of the Basic Skills in Oral Communication

The basic skills in oral communication include the dominant functions of language in contemporary life. Adopting the system proposed by Gordon Wells (1973), a scheme which organizes communication (speech) acts under

major communication functions, experts have identified these five important functions as worthy of instruction:

- The *controlling* function includes our communication attempts to direct or otherwise affect the behavior of another, as well as our responses to control. Requests, suggestions, refusing, and assenting are examples of this function. When teachers ask their students to follow certain rules, they are using the controlling function (both teachers *and* students are engaging in control).
- *Sharing feelings* involves communication acts such as praising, commiserating, ridiculing, approving, and rejecting. All are messages we use to express feelings and to react to the expression of feelings by others. Teachers show their students how they feel about their performance through their verbal and nonverbal messages of praise, rejection, and the like.
- The *informing* function occurs when we provide ideas and information to others, as in naming and giving examples, and when we respond to information given by others, as in answering, questioning, or denying. Teachers and students are probably involved in the informing (responding) function most of the time in the traditional classroom.
- When our messages help to sustain our social relationships, we are *ritualizing*. The ritualizing function includes communication acts such as greeting, thanking, introducing, taking turns in conversations, and teasing. Though teachers might only give instruction on the subject of introducing, the functional view of communication development could include practice in any one of these important communication acts.
- The *imaging* function asks us to deal creatively with reality through our language. Examples include speculating, dramatizing, fantasizing, and storytelling. The holistic view of communication instruction is based on the effectiveness of the imagining function for practicing or "trying on" new communication behaviors in the classroom.

Development of the five communication functions is the heart of the functional approach to oral communication learning. Four guidelines help set the proper perspective for instruction in oral communication.

Communication in everyday situations usually involves a very fluid flow of ideas and feelings, such that no one person is "the speaker" while another is "the listener." Instead, persons serve the roles of speaker and listener simultaneously. Likewise, communication acts for all five functions include initiating strategies (as in requesting) and responding strategies (as in assenting).

Most communication situations include multiple functions at any one time, so that a person can be controlling and sharing feelings at the same time. While one of the functions may be primary and one or more secondary, multiple functions are typical of most conversations.

Oral communication is more than just speech. Gestures, facial expressions, intonation, and posture, among other cues, play an important role in communicating our message to others.

Finally, a dominant mode of learning in all basic skills areas is the oral mode. Instructional strategies in all basic skills include the important oral skills of the teacher and students. For example, in the effective learning of mathematical concepts, instruction may hinge on effective use of the informing function, as well as the imagining function. Without attention to oral communication skills for all students, instruction in other basic skills may fall short of our targets.

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The Instructional Process

The instructional process which suits well the development of functional communication competencies in children and youth is one

based on the four components of competence outlined by Connolly and Bruner (1974, pp. 3-7):

- Competence must first include an adequate *repertoire* of skills in any area. For communication, we seek to develop in children and youth an adequate and varied repertoire of communication strategies (acts) with which they can deal with important communication situations in their daily lives. Instruction should be geared toward increasing children's repertoires so that they are able to gain someone's attention effectively, express affection and hostility appropriately, ask for help when a task is too difficult, and assertively lead a group (White, 1975).
- The second component of competence includes the *selection criteria* children need so they can select from among the strategies in their repertoire the most appropriate one(s) for the particular moment. Helpful criteria include communication parameters, that is adapting a message to persons, setting, topic and task (Cazden, 1972; also Williams, 1970, pp. 81-101), and conversational rules: *quantity* — say enough but not too much; *quality* — speak the truth and have evidence when necessary; *relevance* — stay on the topic; and *manner* — be clear about what you say, and say it with dispatch (Grice, 1975).
- The *implementation* of communication choices is the third component of competence. Our children and youth must be given opportunities to practice verbal and nonverbal strategies which they decide are appropriate in a particular situation. The environment for practice must be supportive and nonthreatening; children should not fear failure, as they may in everyday conversations. Role playing and discussion are key methods students can use to implement basic oral skills. The instructor must not be prescriptive and authoritative; instead, this person must try very hard to be a moderator/discussion leader, helping children discover what they can communicate and how it feels to do it that way. If teachers insist on telling students, "I do it this way" or "Here are the best ways," then the approach will not work effectively.
- Finally, children and youth must use solid *evaluation* procedures in assessing the appropriateness and effectiveness of their communication. Students must know how to evaluate success and failure both in terms of personal objectives ("Did I make my point?") and in terms of relationship objectives ("I hope he still likes me as a friend."). Were communication choices appropriate to the situation or was something "out of place"? Evaluation procedures require that children and youth be aware that they must *adapt their communication to their listeners* (Delia and Clark, 1977a, 1977b).

Organization of Instruction

The oral/functional approach to language arts instruction is centered on communication functions critical to everyday life; this focus contrasts with the more traditional speech activities approach to oral language where public speaking, discussion, and articulation skills are paramount. While the functional approach stresses everyday private discourse, the more traditional approach is centered on popular, public discourse. In one sense, however, the communication functions approach cuts across public meetings, theatrical performances, group discussions, *and* daily conversations. While the functional approach does involve the use of exercises, these exercises must meet certain standards.

First, an exercise must specify and focus on a major communication function, though it can focus on secondary functions as well. The procedures outlined for the students must highlight the use of this function through associated communication strategies or acts. The exercise must be practical, worthy of the students' attention, and well thought out in terms of procedures.

Next, the exercise must involve as many students as possible in the implementation process. Students gain important opportunities in oral communication practice when they are given a chance to role play or communicate in the classroom. Role-playing exercises that are highly familiar to the students, where they can easily imagine what to say and do, are the fundamental approach of the implementation process. Through the effective discussion-

leadership techniques of the teacher, the students themselves provide the observations and evaluations in the question-and-answer portion of the activity. Examples of the question approach are:

1. What different approaches did my friends try? (repertoire)
2. What were factors that may have helped them decide to do it that way? (selection criteria)
3. How effective was their approach, in terms of how they handled themselves? (implementation)
4. Was one message better than another? Why? (evaluation)

The question-and-answer portion of the activity requires that students observe, classify, comment, and support judgments about their own communications and those of their classmates.

Students benefit most from communication exercises in which they make choices, try out strategies, evaluate their effectiveness, and then discuss their personal and relational goals . . . Let the students handle the evaluation process so that learning can be maximized.

The functional communication competencies build outward from the classroom, to the family, to peer group, and further outward to the neighborhood and the community. Students at all grade levels, from preschool through high school seniors (Wood, 1977), practice using the five communication functions. The only differences for the different age groups are our expectations of their performances in the activities and in the question-and-answer period. More experienced and older students give more examples, use a larger repertoire of strategies, and use a more refined set of selection criteria. Further, they are better able to express the criteria they use in making choices. Their role playing or communication performances will probably be more creative, and their evaluations in the question-and-answer session will be supported with more evidence.

Teachers at all levels must have certain skills in classroom management. The instructor must be able to summarize effectively the action and conversations taking place. Comparisons of the different approaches employed by the groups of children should be made, and the instructor can serve as the discussion leader eliciting these comparisons. The three most important skills of the instructor in the functional approach to oral language development are (1) observation and description of communication, (2) summarizing communication, and (3) leading discussion about comparisons of communication behavior. Note that *not one of these three skills is offering evaluations of children's communication choices.* The technique of classroom management underlying the functional approach is for the instructor to lead students into making evaluations of themselves and their peers. The instructor should refrain from offering suggestions on how the children "might handle" the situation or "should communicate." Instead, by leading the discussion of goals and intentions of those communicating, the teacher can often lead students into drawing evaluative conclusions. How then will educators evaluate the progress of instruction centered on the oral/functional approach?

Evaluation of students' progress using the functional approach to communication rests in the student-teacher discussion of their observations and analyses of classroom efforts. The evaluative component is based on the richness of those observations and of assessments offered by the students in the question and follow-up session. Since this period contains questions based on the four components of instruction — repertoire, selection criteria, implementation, and evaluation — the instructor will be able to assess the students' developing ability to view communication from this perspective. Students benefit most from communication exercises in which they make choices, try out strategies, evaluate their effectiveness, and then discuss how their communication accomplished their personal and relational goals. Though students may benefit from suggestions offered by the instructor, suggestions of this nature are not

often incorporated into the students' communication systems.

If the instructor believes that students have behaved quite inappropriately, she or he can use one of the following approaches to get the children evaluating their peers' behavior: "Johnny just did thus and so; how do you think his approach would work?" "How do you think Bill felt when Johnny just did thus and so?" "Bill, how did you feel when Johnny said that to you?" "Bill, would you try that approach with someone else?" Let the students handle the evaluation process so that learning can be maximized. Teachers must not become preachers; instead, children must learn to think, feel, and evaluate for themselves.

An example of the oral communication approach to each of the five functions is given by the following exercises, taken from *Development of Functional Communication Competencies: Pre-K–6* and *7–12* (Wood, 1977a, 1977b), both Theory and Research Into Practice booklets published by the Speech Communication Association and the ERIC Clearinghouse on Reading and Communication Skills.

Making A Pitch (Grades 7 and 8)

Primary function: Controlling

Objective: Choosing, developing, and testing psychological appeals in persuading someone to volunteer.

Procedures: Have the students select a cause which is operative in the school or community, and given them one week to find out about the actual needs of that particular cause. For example, the Red Cross needs blood donors; a senior citizens group needs telephone volunteers; a scout troop needs used camping equipment; a day-care center needs odds and ends for craft supplies; and an elementary school needs older students to tutor reading. Ask the students to make a persuasive speech in which they attempt to get assistance from the members of the class. Try to let the students talk until they actually persuade someone to do what they want, but if ten or more minutes go by, the teacher may have to call time. After each talk, interview the volunteer and identify what appeal the person responded to. Make a list of these successful appeals. If no one volunteers, discuss why they did not.

Questions/follow-up:

1. What appeals were successful? Unsuccessful? (R)*
2. What special factors might also account for success or failure? (For example, "I said it was all right because John is my friend." "I said it was fine because I always wanted to do that anyway." "I did not respond, because we don't have any used camping equipment. If I had any, I would have said yes.") (E)
3. In cases of failure, can you think of other approaches? (S)
4. Within two or three weeks, follow up the assignment. Did the volunteers go through with it? (I) (Incidentally, you may wish to have each volunteer report his or her experience.)
5. What sorts of psychological appeals seem to work best? (E) Not as well? (E)

How Would You Feel? (Grades 1–3)

Primary function: Feeling

Objective: Expressing feelings concerning positive and negative situations that happen to all children.

Materials: Some readily available prompt pictures of events discussed might help things get started with some groups.

Procedures: Break up the class into groups of five children. Set the scene for potentially emotion-laden situations. Examples are: (1) How would you feel if you were lost in a big department store? (2) How would you feel if you got a bike for your birthday? (3) How would you feel if your favorite friend gave you a hug? (4) How would you feel if you got a new pair of shoes? (5) How would you feel if you didn't get invited to your friend's birthday party? Students respond to each situation, one at a time, in a group.

Questions/follow-up:

1. How many different words for feelings can we list? (Write on the board or just brainstorm.)
2. Point to one feeling word (or say one) and ask, "How many ways can you think of to express this one feeling? (Encourage nonverbal ways also.) (R)
3. Would you tell your friend that you're angry

*Repertoire (R), Selection (S), Implementation (I), Evaluation (E)

any differently than you would tell your dad or mom? (S)
4. Which ways do you think best for telling someone you are happy or angry with them? (E)
5. Let's say that you wanted to tell me, your teacher, that you were very mad at me because I asked you to stay in from recess. How would you tell me? (I)

The Investigators (Grades 9–12)

Primary function: Informing

Objective: Identifying, evaluating, and engaging in information skills, such as questioning, investigating, answering, and reporting.

Materials: A list of information sources and specific task assignments.

Sample task assignments: (1) a minister — to find out what kind of training was necessary for that position; (2) a florist — to find out the seasonal trends in flower sales; (3) a mechanic — to find out how the person started his or her career; (4) the bank — to find out the advantages and disadvantages of different savings plans; (5) the guidance counselor — to find out what SAT scores are down; (6) the principal — to find out why he or she went into administration. Other sources include field trips to a radio/television station and a newspaper office, and a discussion with a professional reporter about his or her perception of the job.

Procedures: The class is divided into groups of five or six students. Each group is given an information source and a specific task assignment and must talk with and secure the proper information from the source. After the information is collected, the group will select the most interesting pieces of information and design an information presentation. The presentation may come in any form — television program, radio program, film, pictures, slides, issue of a magazine, newspaper article, theater presentation, or a combination.

Questions/follow-up:
1. What different methods were used to get information from your source (for example, direct questions, soliciting brochures, on-the-job observation, and so on)? (R) Which of these yielded the most information? (S,E)
2. How did you select which information you would present? (S,E)
3. If you were to do the assignment again, what would you do differently? (I) Why would you do it differently? (E)

Notice Me (Pre-K–K)

Primary function: Ritualizing

Objective: Gaining the attention of adults to get answers to difficult questions through the use of acceptable rituals.

Materials: Situation cards for presentations.

Sample situations: (1) A grocery store clerk is checking out items, and children arrive to inquire about a lost puppy that might have wandered in. How would you address the clerk? What would you say? (2) A group of children have been playing catch, and an older child took their ball. They notice a teacher talking to other teachers on the other side of the playground. How would you get help from the teacher who is busy talking?

Procedures: Divide the class into groups of four to five children. Present a situation to them and ask them to pretend to be people in the story (for example, clerk, customer, and two children who have lost their puppy). Let each group role play how they think it might happen.

Questions/follow-up:
1. What things did you do to make the person notice you? (R)
2. Did you say different things to the teacher than to the grocery store clerk? (S) What would you say to get the attention of a police officer? (S)
3. What do you think are the fastest ways to get an adult's attention? (E) Are the fastest ways always the best ways? (E)
4. What if you couldn't interrupt at all — you couldn't say a word — to get my attention on the playground. Show me ways you could get me to notice you *without talking at all.* (I)

Restaurant (Grades 4-6)

Primary function: Imagining

Secondary function: Ritualizing

Objective: Role playing the "typical" behaviors of children and adults in a restaurant scene; analyzing verbally the portrayal of those roles.

Materials: Table, chairs, table setting, menus, tray, notepad, and a slip of paper describing the role-playing situation.

Procedures: Six students assume the following roles: Mom, Dad, Susie the Dreamer, Crabby Jimmy, the busy Waitress, and the Hostess. A table is set up with four chairs and a variety of objects. Ideally, menus are obtained from a local restaurant, and some flatware and dishes are used. The

teacher may vary the situation by changing the character names or selecting another familiar restaurant. The six role players are given directions that indicate their roles in the situation. The rest of the class members act as observers. The directions may be the following: You are a family having breakfast at Howard Johnson's Restaurant. Dad will pay for the meal but he only has eight dollars with him. The hostess will seat you and the busy waitress is assigned to your table. The players then have the freedom of interpreting their parts, such as age and personality. The job of the class observers is to decide if the role-players' behavior is appropriate for the personality chosen and if it is appropriate for the situation.

Questions/follow-up:

1. How did the role players tell us by tone of voice or by body language what their roles were? (R) What did the role players say to tell us what their roles were? (R)
2. What else might have been done or said by each character? (S)
3. Try it again, with different people in the same roles. (I)
4. Are the roles more fully developed in the second try? (E) Did we learn anything more about each person? (E) How did we learn? (E,S,R)

Instructional Planning

Because the functional communication approach has only been developed within the past five to ten years, no large-scale application has occurred. Many school districts and state education agencies are incorporating the functional approach into their curricular goals and revisions, though few programs have been designed and tested for their effective development of communication competencies. Ideally, input for functional development should come from needs and perceptions of students and their families and friends. Since instruction supposedly deals with *critical communication situations*, definitions of just what is critical must come from the most appropriate sources. Children, their families, and educational experts can participate together in defining the critical communication situations and associated functional skills. Getting good summer jobs, talking to customers, being a good parent, getting along with your neighbor — all are general situations which include possible critical communication skills. If interviewing for a job is an important communication situation for high school seniors in a community, then instruction must focus on the informing function (e.g., stating job objectives, asking good job-related questions), as well as the controlling function (e.g., convincing a prospective employer that you are qualified for the position and highly motivated).

For much too long a time, teachers and textbook writers have decided which communication situations are critical for children. Input from the children themselves, as well as their families and members of the community, was not really important. The functional approach to the development of oral communication insists that the children, their families, and members of the community participate in defining the thrust of the curriculum.

Strengths and Weaknesses

The greatest plus for the functional communication approach is that it is extremely *sensitive* to the needs of children and youth. Since everyday functions in the students' lives become the core of the program, and since instruction is geared to the five functional skills, students benefit more broadly from their classroom experiences. Classroom exercises which focus on practical issues, everyday concerns, and human relationships make the classroom come alive for children.

The major weakness of this approach most often cited by administrators and teachers is that it is difficult to do properly. Teachers are usually trained to give information, guidance, and advice. They find it extremely frustrating when they are told not to evaluate; their natural tendencies are to say what they think went well and what failed. A second weakness is related to the fact that this approach is still in its infancy: few materials have been developed for classroom use. Consequently, school districts and curriculum committees are forced to develop programs "from scratch." While some materials are useful in starting these programs (Allen and Brown, 1976; Allen and Wood, 1978; Bassett et al., 1978; Larson, 1978; Wiemann, 1978; Hopper and Wrather, 1978; Book, 1978), the task of putting together an oral communication program

based on functions is a difficult and time-consuming one.

Programs have been developed in Berea, Ohio, St. Paul, Minnesota, and many school districts in Massachusetts, California, and Texas. Other programs are in progress in hundreds of cities across the country, though the Speech Communication Association is just beginning to gather information on methods and evaluation instruments.

With instruction on the development of oral communication competencies, children and youth will acquire a new perspective on life. They will understand and use effectively the dominant functions of language. They will feel confident in their use of language as they interview for that special job, when they ask an expert for help, or when they express sympathy to a friend who has just lost a loved one.

There is no subject of instruction in any educational program more important to a child's future than oral communication, and the functional approach to developing oral communication skills is both effective and sensitive in meeting the communication needs of children and youth today.

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Oral Communication: Individual Skills Focus

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Editors' Note: *Fred Jandt reviews efforts of several states to define minimal competencies for speaking and listening. He gives examples of specific competencies adopted by states and districts — including competencies for different grade levels. He notes some of the difficulties in assessing oral communication and discusses a set of criteria for evaluating tests and procedures for assessing speaking and listening skills. Dr. Jandt's paper includes the Speech Communication Association's "Guidelines for Minimal Speaking and Listening Competencies for High School Graduates."*

Barbara Lieb-Brilhart, acting then as Associate Executive Secretary of the Speech Communication Association, wrote to Senator Thomas Eagleton in an April 3, 1979, letter:

> Increasing evidence points to the importance of oral communication skills in achieving academic, vocational and personal success. Yet, it is estimated that fewer than half of our nation's elementary and secondary pupils receive adequate oral communication training from qualified teachers. Indeed, our strongest oral communication programs are found in institutions of higher learning which are attended by only a portion of our citizens, at a time when it is almost too late for such instruction to begin.

During the past several decades, the language arts have emerged as a core part of the curriculum in elementary schools. It would seem logical that speech communication would be an integral part of language arts programs, yet that has not been the case. Kenneth Brown's 1965 review of language arts textbooks revealed that approximately 25 percent of their contents dealt with speech curriculum. Textbooks in 1980 do not show a substantial increase in their attention to the speech communication needs of students. William Possien, in reflecting upon language arts curricula, said:

> It is apparent that a wide discrepancy exists between the recommended philosophy and procedures for language instruction and the actual practices in classrooms .... Our programs would appear to be based on two assumptions: first, that written communication is more important than and precedes oral communication, and, second, that people learn to speak by writing. (pp. 9-16)

The responsibility for such erroneous assumptions, which continue today, must be assumed by both elementary educators and scholars of speech communication.

The need to rethink the role of speech communication instruction in the secondary school curriculum is also critical. As part of a study of state practices in secondary schools sponsored by the Speech Communication Association, Brown surveyed Massachusetts (Brown et al., 1979). Because Massachusetts has well-devel-

oped statements of competencies, data from that state are particularly useful. Among their major findings are that a majority (53.5%) of secondary schools responding to the survey have a speech program, but a substantial minority of schools (46.4%) reported that no speech program exists in their schools. The typical basic course is an elective, one-semester course offered each year sometime between tenth and twelfth grade. It generally includes one section of 20-25 students who meet every day for 40- to 60-minute class periods. The basic course most frequently combines public speaking, interpersonal communication, and other activities such as debate and group discussion. Students are evaluated through both written examinations and oral presentations.

In 66.4 percent of the schools, instruction in speech is not combined with instruction in other courses. When this does happen, speech instruction is found most frequently in English courses (24.1% of the schools). The majority of teachers teaching speech

- received their undergraduate degrees within the past twenty years;
- more often majored in English (46.6%) than in speech, communication, or theatre (26.7%) at the undergraduate level; their minors are distributed fairly evenly between education (18%) and English (16%);
- are either engaged in or have completed graduate work (71.5%); at the graduate level they tend to major in speech/communication/theatre or English;
- are not affiliated with professional organizations in speech or in other fields; and
- have been teaching the subject and directing speech activities ten or fewer years (64.6%).

About one third of the schools responding to the survey have one speech-trained teacher. Eighteen percent have two speech-trained teachers, and less than 10 percent have three speech-trained teachers. In only 19.8 percent of the schools do speech-trained teachers teach only speech communication courses. When teachers are assigned courses other than speech, they are typically assigned English courses.

In 1978, Congress very wisely expanded the National Reading Act to the Basic Skills Improvement Act (Title II) in order to assist children in mastering "the basic skills of reading, mathematics and *effective communication, both written and oral.*" Over the course of the next few years, this will probably mean that more attention will be given to speech communication instruction, at both the elementary and secondary levels. With this increased attention will come increased concern — it is already very evident — about what skills should be taught and about assessment procedures (Hout, 1977). Much has already been done — by the Speech Communication Association and by a number of states — to assist administrators and teachers as they tackle these problems.

Minimal Competencies

In 1977 the Educational Policies Board of the Speech Communication Association established a task force to recommend minimal speaking and listening competencies for high school graduates (Bassett et al., 1978). A search was conducted to identify the speaking and listening competencies which state education agencies and research specialists consider essential for high school graduates. Nineteen speaking and listening skills were agreed upon as basic to two-person interactions (face-to-face or by telephone), small group discussions, and public speaking situations. The listening skills are applicable to messages from radio, television, and motion pictures. The guidelines they developed, "Guidelines for Minimal Speaking and Listening Competencies for High School Graduates," follow this paper.

Five states — Vermont, Virginia, Oregon, Utah, and Massachusetts — have developed minimal competencies in speaking and/or listening to be implemented either on a statewide basis or as a local option. The lists developed by these states provide examples for writing competencies in such a way that they can actually be assessed.

Vermont (Vermont Department of Education, 1977; 1978) has developed seven speaking and three listening competencies:

Speaking (paraphrased for brevity)

1. Give geographical directions
2. Demonstrate organization, sequence, clarity, and accuracy in explaining a process, making a report, or expressing an opinion

3. Answer a business telephone and take a message
4. Get information using a telephone
5. Introduce self and others
6. Interview for a job
7. Participate in and listen to others in informal group discussions

Listening

1. Follow three-step directions
2. Retell important events in a story sequentially
3. Summarize essential details of an oral presentation

Virginia's Basic Learning Skills Program is designed for grades K-6 (Virginia Division of Elementary Education, 1977). It includes two major speaking skills and two major listening skills, each of which is further defined by more specific minimum objectives. Each minimum objective is keyed to a grade range (K-2, 1-3, 4-6). The four major objectives are:

Speaking

1. The student will use correct and appropriate language. (This goal has six minimum objectives.)
2. The student will speak effectively in a variety of situations. (Sixteen minimum objectives)

Listening

1. The student will comprehend main ideas and specific details of an oral communication. (Eight minimum objectives)
2. The student will comprehend that the meaning of an oral communication is influenced by many factors. (Eleven minimum objectives)

Oregon's minimum competencies include demonstration of ability to read, write, speak, and listen (Oregon Department of Education, 1978a and 1978b). School districts must include language arts/English in their K-12 curriculum. Suggested goals that pertain to speaking and listening are —

1. Speaking effectively when addressing different purposes and different audiences
2. Using language effectively in interacting with individuals and groups
3. Using appropriate conventions in communicating ideas clearly and concisely
4. Listening purposefully in acquiring, interpreting, and evaluating information
5. Using non-verbal communication to express ideas, attitudes, and feelings
6. Describing a variety of ways in which ideas are expressed

Utah requires two kinds of minimal competencies: basic skills and life skills (Utah State Board of Education, 1977). Basic skill competencies are reading, writing, speaking, listening, computation, and problem solving. Life competencies are in four areas: consumer of goods and services, career, health and safety, and democratic governance. Both sets of competencies are interrelated. For example, there are four speaking and four listening competencies. Each one is related to a life competency, as in the following examples:

Speaking

1. Consumer of goods and services. Negotiates business transactions, expresses needs and conducts other consumer-related oral communication with sufficient clarity, volume, and purpose.
2. Career. Conducts career-related oral communication; for example, responding to questions in a job interview with sufficient clarity, volume, and purpose.
3. Health and safety. Explains symptoms to doctor, requests safety information, and conducts other health- and safety-related oral communication with sufficient clarity, volume, and purpose.
4. Democratic governance. Expresses views, questions officials, and conducts other citizenship-related oral communication with sufficient clarity, volume, and purpose.

Listening

1. Consumer of goods and services. Listens and responds appropriately to commercials, instructions, and other oral communication necessary as a consumer of goods and services.
2. Career. Listens and responds appropriately to questions and other oral communications related to career.
3. Health and safety. Listens and responds appropriately to doctors' instructions, safety warnings, and other oral communications related to health and safety.
4. Democratic governance. Listens and responds appropriately to statements by elected officials, participants in a discussion, and other citizenship-related oral communication.

In **Massachusetts**, Project Signals is developing statements of student outcomes. Still in draft form only, the list includes:

Speaking

1. When the purpose is giving *information*, students can:

a. Give directions others can follow
b. Describe objects, events, experiences, and ideas

2. When their purpose is *controlling* others, students are able to:
   a. State an opinion effectively
   b. Persuade others when appropriate
3. When the purpose is communicating feelings or attitudes to others, students can:
   a. Express their opinions, feelings, and thoughts
   b. State feelings so others are not offended
4. When the purpose of speaking is to use the *imagination*, students can demonstrate:
   a. Improved story telling
   b. Improved creativity
   c. Improved appreciation of oral language
5. When the purpose is effective *ritualizing* (social interaction) with others, students can demonstrate:
   a. Improved comfort in social situations
   b. Increased flexibility in language

Listening

1. When the purpose is getting information, students can demonstrate:
   a. Improved comprehension of spoken messages outlining events and ideas
   b. Improved following of directions
   c. Improved ability to work effectively in a group
2. When the *speaker's* purpose is *controlling*, *listeners* can:
   a. Distinguish fact from fiction
   b. Evaluate the consequences
3. When the purpose is understanding another's feelings, students can demonstrate:
   a. Improved attentiveness
   b. Improved empathy
4. When the purpose is listening imaginatively, students can produce:
   a. More heuristic responses
   b. More creative responses

Massachusetts has also adopted a set of speaking and listening competencies for higher grade levels (Commonwealth of Massachusetts Department of Education, 1979).

Speaking

1. Basic oral communication skills
   a. Use words and phrases appropriate to the situation
   b. Speak loudly enough to be heard by a listener or group of listeners
   c. Speak at a rate the listener can understand
   d. Say words distinctly
2. Planning, developing, and stating spoken messages
   a. Use words in an order that clearly expresses the thought
   b. Organize main ideas for presentation
   c. State main ideas clearly
   d. Support main ideas with important details
   e. Demonstrate knowledge of standard English usage
3. Common uses of spoken messages
   a. Use survival words to cope with emergency situations
   b. Speak so listener understands purpose
   c. Ask for and give straightforward information
   d. Describe objects, events, and experiences
   e. Question other viewpoints

Listening

1. Basic listening skills
   a. Recognize words and phrases used by the speaker
   b. Indicate why the speaker can or cannot be understood
2. Understanding what you hear
   a. Understand spoken words and ideas
   b. Identify and understand main ideas
   c. Associate important details with main ideas
   d. Understand descriptions of events and experiences
   e. Understand speaker's purpose
3. Using what you hear
   a. Understand and respond to survival words used in emergency situations
   b. Summarize information and draw conclusions
   c. Recognize when words and phrases are used to convince or persuade
   d. Follow straightforward directions

Taken together, these statements reflect at minimum a concern that students be able to communicate in a variety of situations with clarity appropriate to the audience and that they be able to hear and restate spoken messages.

Concern for minimal competencies is also reflected at the local school district level, as Brown discovered in correspondence with several districts. The Parkrose School District of Portland, Oregon, requires students to demonstrate two major listening competencies and four major speaking competencies. Each competency is further divided into several specific "indicators." The school district provides courses in speaking and listening at both the junior and senior high school levels. Successful completion of the courses constitutes sufficient

evidence that the minimum competencies have been met. Thus, speech teachers certify that students have met the competencies through the regular instructional program.

The Lincoln, Nebraska, schools employ the speaking/listening competencies developed by the Speech Communication Association (see Bassett, Whittington, and Staton-Spicer, 1978). Each competency is assessed informally in the elementary grades and more formally in the junior and senior high school years. "Formal" assessment includes evidence that the student has achieved more than 50 percent of a set of specific indicators for each of the ten major competencies. Also, students who have successfully completed speech, debate, or drama courses are judged as having achieved the given competencies.

The Westside Community Schools of Omaha, Nebraska, also require students to demonstrate minimal competencies in oral communication. In the second semester of their sophomore year, students are tested on their ability to present ideas orally. The test situation may be a formal talk or a talk in a more informal setting. Seven competencies are assessed; all emphasize speaking more than listening. The test — a dichotomous rating scale (yes-no) — is administered by the student's homeroom advisor. Students must receive 100 percent yes responses before the minimum competency is met. School administrators indicate that the lack of rater reliability is the "biggest weakness" with the oral communication competencies.

The Gary, Indiana, school district assesses students' oral proficiency in seven areas: articulation, pronunciation, verbal utterances, rate, word usage, voice qualities, and volume. Students are assessed in the sophomore level "General Speech" course. While this course includes listening, listening is not assessed as a part of oral proficiency.

In Gary, oral proficiency was tested originally in one of four situations selected by the student: an interview with a personal interest, educational, or biographic theme; a topic format stressing an impromptu response; a question format; and a prepared speech format. Currently students are evaluated only in an interview situation. The examining team of two speech teachers randomly selects three to five situations from a master list of thirty-two questions. Student responses are rated holistically — for each proficiency — on a four-point scale: 1 = severely deficient; 2 = deficient to moderately deficient; 3 = average proficiency; and 4 = moderate to high proficiency. Using this scale, ratings of 1 and 2 are failing. Ratings of 3 and 4 are passing. Audio tapes of student responses are kept confidential and are used only upon student/parent objection to the score. Teachers do not rate students in their own school.

Assessment Procedures

The difficulty of assessing speaking and listening skills represents one of the great challenges to the educational community as Title II takes effect. The problems of assessment have led some states and localities to adopt commercially available tests of reading and mathematics as their initial competence assessment devices. Available tests can very easily come to define the competence rather than desired competencies guiding the selection of appropriate assessment instruments (Haney and Madaus, 1978).

The few samples of minimum competency tests that are available suggest that, despite their new name, most such tests are quite old in format: multiple choice, true-false, or short answer (NASSP, 1976). Instead of having students actually perform certain tasks in order to demonstrate their competencies, as is the case, for example, with the performance part of the driver's license test, these instruments assess competencies indirectly by having students perform paper-and-pencil tasks that are presumed to correlate with the competencies of real interest. In assessing competence for high school graduation, for example, districts often do not require students to write anything. Instead, students are asked to identify mistakes in a writing sample using a multiple-choice format (NASSP, 1976).

The prime virtue of such indirect forms of assessment is that they are inexpensive to administer and to score. Yet with the care and time given to developing minimal competencies, can any less care or time be given to having the student demonstrate the competency as

it is described in the competency statement? If students are expected to be able to summon emergency help using the telephone, should they not be asked to demonstrate that competency rather than respond to a multiple-choice question concerning dialing emergency numbers? As Banesh Hoffmann warned in his *Tyranny of Testing* (1962), indirect techniques of assessment may themselves become the focus of concern instead of the real competencies which they are presumed to measure.

Another problem is that in some cases minimum competency tests are not measuring what students have been taught — or at least not what they've been taught recently (Haney and Madaus, 1978). Children from ethnic and cultural minorities, for example, may well have been taught communication skills appropriate for their culture. Even testing itself may be valued differently. Maria Ramirez, Assistant Commissioner for General Education and Curricular Services, New York State Department of Education, explained this at the 1978 National Conference on Achievement Testing and Basic Skills (1979). There is no such thing as culture-free achievement testing, she argued. The very act of achievement testing assumes a cultural value placed on achieving. A number of subcultures do not value achievement quite as highly as the majority population. "Some groups are more cooperative than aggressive, more deferential than competitive. Rewards are primarily for the group, not for the individual. Thus, the first cultural bias of achievement testing is the very concept itself."

The question becomes not how to eliminate cultural bias from achievement tests, but how to be sure that the biases are valid.

The question becomes not how to eliminate cultural bias from achievement tests, but how to be sure that the biases are valid. Ramirez made specific suggestions: The area selected for achievement testing should be an important part of the culture in which a child has functioned or is to function. If the area is not one likely to have been experienced outside the school's curriculum, it should be an actual part of the curriculum. And if the area is part of the curriculum, it must actually be taught in the classroom of the student to be tested. Language knowledge and skills knowledge should not be confounded in the preparation and administration of tests. Tests of skills knowledge must be given in a student's first, that is, most proficient, language while second language skills must be understood and measured for proficiency in the second language alone. Translation is not enough. Many monosyllabic English words become polysyllabic words in Spanish, and levels of difficulty may not be equivalent.

More directly, at the same conference, Harold Howe II, Vice President for Education and Research, the Ford Foundation, stated:

> I have to raise the difficult question of whether the national mood for improving basic skills performance has hidden within it overtones of racism. There is no simple answer ... we do black children a disservice not to hold them to the same expectations we do white children. At the same time, we know that inequalities in the lives of children outside the school are reflected in school performance, and the black, Hispanic, and native American children are peculiarly subject to handicaps from both poverty and discrimination.

In light of these legitimate concerns, the SCA Educational Policies Board Task Force on Assessment and Testing proposed a set of criteria for evaluating tests and procedures for assessing speaking and listening. The following criteria were adopted by the association:

1. Stimulus materials should require the individual being tested to demonstrate skill as a speaker or listener.
2. Assessment instruments and procedures should clearly distinguish speaking and listening performance from reading and writing ability; i.e., inferences of speaking and listening competence should not be made from tests of reading and writing, and directions and responses for speaking and/or listening tests should not be mediated through reading and writing modes.
3. Assessment instruments and procedures should be free of sexual, cultural, racial, and ethnic content and/or stereotyping.

4. Assessment confirming the presence or absence of skills should not be confused with other testing to determine why individuals demonstrate or fail to demonstrate the skills.
5. Assessment should emphasize the application of speaking and listening in familiar situations; i.e., stimulus material should refer to the situations familiar to the individual being tested, and responses should be evaluated for demonstration of skills rather than for accuracy of content.
6. Assessment should allow for various communication settings rather than be limited to one setting.
7. Assessment should involve situations that allow for a range of acceptable responses.
8. Assessment should demonstrate that outcomes are more than just chance evidence.
9. Assessment should provide results that are consistent with other evidence that might be available.
10. Assessment should have content validity.
11. Assessment procedures should be standardized and detailed enough so that student responses will not be dependent on the administrator's skills in administering the procedures.
12. Assessment procedures should be as free as possible of such negative outcomes as undue stress or anxiety.
13. Assessment procedures should be practical in terms of cost and time.
14. Assessment should involve simple equipment.
15. Assessment should be suitable for the individual being tested.

Conclusion

Concern for competent communication skills in today's society was expressed by then U.S. Commissioner of Education Ernest L. Boyer in a 1977 address to the national convention of the Speech Communication Association in Washington, D.C. Dr. Boyer called for educators to redefine literacy by acknowledging the communications revolution of print, radio, and television and to redefine the basics to help students become more sophisticated senders of messages:

> One of the unhappy characteristics of our culture is the trend toward increased passivity. We are soaking up the messages of others and becoming less effective in formulating messages of our own. All across America tonight, millions of families will be transfixed by their glowing television screens. Millions of people will spend from three to five hours in those darkened rooms — watching, listening, absorbing. They will be sponges — soaking up the messages. They will be passive, not active, communicators. Instead of speaking, they will be listening. Instead of formulating their own ideas, they will be the targets of thoughts hurtled at them. We have become a nation of receivers, not of senders. Small wonder that signs point to a decline in our ability to express ourselves clearly and precisely.

There is general agreement that listening and speaking skills are critical for a fully functioning adult. Professional organizations and some states and local districts have moved to define those skills and the levels of performance required. Textbook publishers and teacher training institutions must also begin to recognize that speaking and listening skills must be taught directly, independent of their relation to reading and writing skills. As Dr. Boyer argues, we must educate our youth to be more critical receivers of messages — particularly those of the media — and to be better senders of spoken messages. These skills are most critical at the younger grade levels where many of our nation's schools are not providing children with the help they need to become critical and effective communicators.

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Communication Education

Figure 1

Guidelines for Minimal Speaking and Listening Competencies for High School Graduates*

1. *Communication Codes.* This set of skills deals with minimal abilities in speaking and understanding spoken English, and using nonverbal signs (e.g., gestures and facial expressions).

	Application Examples		
Competencies	Occupational	Citizenship	Maintenance
A. Listen effectively to spoken English.	Understand directions given by job supervisor.	Understand directions given on TV or radio on procedures necessary to vote.	Understand weather bulletins broadcast on radio or TV.
	Understand complaints and needs of customers.	Understand directions to a jury from a judge.	Understand a doctor's directions for taking prescribed medication.
	Understand suggestions and questions of fellow workers.	Understand directions given by policemen.	Understand a plumber's suggestions for preventive household maintenance.
B. Use words, pronunciation and grammar appropriate for situation.	Use appropriate language during employment interviews.	Use language understood by members of diverse groups at civic meetings.	Describe an ailment so that a doctor can understand the symptoms.
	Use words, pronunciation, and grammar which do not alienate co-workers.	Use inoffensive words when expressing political views.	Use language understood by a policeman when making a complaint.
	Use words understood by co-workers.	Use language understood by public officials.	Use language understood by a banker when making a loan application.
C. Use nonverbal signs appropriate for situation.	Use appropriate gestures and eye contact during employment interviews.	Use appropriate facial expressions and posture when expressing your point of view at civic meetings.	Use gestures which enhance a child's understanding of how to perform a household task.
	Use appropriate facial expressions and tone of voice when conversing with a supervisor.	Use appropriate nonverbal signs when campaigning for a political candidate.	Use gestures which enhance a friend's understanding of how to play a game.
	Use gestures which aid a co-worker in learning to perform a production task.	Use appropriate nonverbal signs when engaging in informal discussions of political views with friends.	Use nonverbal signs to indicate sympathy to a friend.

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(Figure 1 Continued)

D. Use voice effectively.	Use sufficient volume when making a presentation to a large group in an on-the-job setting.	Speak clearly and loudly enough to be heard in public debate or discussion.	Speak with appropriate rate, volume and clarity in social conversations.
	Use appropriate volume when conversing with a customer via telephone.	Speak with appropriate rate, volume and clarity when expressing your views to an elected official.	Speak with appropriate rate, volume and clarity when reporting a fire or accident.
	Speak with appropriate rate, volume and clarity when conversing with your supervisor.	Speak clearly and loudly enough to be heard and understood when giving testimony in court.	Speak with appropriate rate, volume and clarity when soliciting funds for a charity.

What Should Be Assessed?

II. *Oral Message Evaluation.* This set of skills involves the use of standards of appraisal to make judgments about oral messages or their effects.

	Application Examples		
Competencies	Occupational	Citizenship	Maintenance
A. Identify main ideas in messages.	Identify the task to be performed when given instructions orally.	Select main ideas when listening to political speeches.	Obtain main ideas in messages concerning health related news.
	Recognize performance standards for work assigned orally.	Identify key points in broadcast interviews with political candidates.	Identify main ideas in broadcast messages about tax return preparation.
	Recognize commitments, promises, threats, and commands.	Identify critical issues in trial testimony.	Identify main ideas in a contract agreement.
B. Distinguish facts from opinions.	Obtain factual information about job opportunities.	Distinguish between facts and opinions in political speeches.	Distinguish facts from opinions in advertisements.
	Distinguish between facts and opinions in customer complaints.	Distinguish between evidence and opinion in testimony.	Distinguish facts from opinions with respect to effective illness treatment.
	Distinguish between facts and opinions in labor-management disputes.	Distinguish between fact and opinion in newscasts.	Distinguish facts from opinions regarding nutrition.

(Figure 1 Continued)

C. Distinguish between informative and persuasive messages.	Distinguish between informative and persuasive messages in a job interview. Distinguish between informative and persuasive messages from a union organizer. Distinguish between informative and persuasive messages of management.	Identify when being subjected to propaganda. Distinguish between informative and persuasive messages of politicians. Distinguish between informative and persuasive messages of trial attorneys.	Identify when being subjected to a sales presentation. Distinguish between informative and persuasive messages about purchasing on credit. Distinguish between informative and persuasive messages about nonprescription drugs.
D. Recognize when another does not understand your message.	Recognize lack of understanding in other employees. Recognize when a job interviewer doesn't understand your explanation of your work experience. Recognize when a customer doesn't understand your directions for product use.	Recognize when another doesn't understand your position on a public issue. Recognize when a public official doesn't understand your request. Recognize when a judge does not understand your testimony.	Recognize when another family member doesn't understand your instructions. Recognize when a doctor doesn't understand your description of your illness. Recognize when a salesperson doesn't understand your request.

Communication Education

III. *Basic Speech Communication Skills*. This set of skills deals with the process of selecting message elements and arranging them to produce spoken messages.

	Application Examples		
Competencies	Occupational	Citizenship	Maintenance
A. Express ideas clearly and concisely.	Make a report to your job supervisor. Explain job requirements to a new employee. State clearly relevant information about your work experience when applying for a job.	Describe a desired course of political action. Describe an accident or crime to a policeman. Explain citizens' rights to another.	Explain an appliance malfunction to a repair person. Explain an unfamiliar task to a child or other family member. Explain your values to your child or a friend.

(Figure 1 Continued)

B. Express and defend with evidence your point of view.	Express and defend your view in a union meeting. Express and defend your suggestions for changes in job conditions. Express and defend your reasons for job absence to your supervisor.	Express and defend your view in a political discussion. Express and defend your innocence in court. Express and defend your position in a city council meeting.	Express and defend your refusal to accept products or services you didn't order. Express and defend your faith or religion. Express and defend your feelings in a family discussion.
C. Organize (order) messages so that others can understand them.	Use a chronological order to explain a complex business procedure to a co-worker. Use a topical order when explaining production problems to a supervisor. Use a problem-cause-solution order when making a suggestion to a supervisor.	Use a topical order to explain your political views. Use a cause-effect order when giving an accident report. Use a chronological order to explain your complaint to an elected official.	Use a problem-cause-solution order to explain your financial position when applying for a loan. Explain to your child how to prevent accidents using a cause-effect order. Use a chronological order to explain to a mechanic the development of an automobile malfunction.
D. Ask questions to obtain information.	Obtain information about correct job performance procedures. Obtain information about job benefits. Obtain suggestions about how to improve your job performance.	Obtain information from public officials about laws and regulations. Obtain information about another's evidence on a political issue. Obtain information about a political candidate's views.	Obtain information about interest rates for purchases bought on credit. Obtain information about your credit rating. Obtain information about product safety.
E. Answer questions effectively.	Answer a potential employer's questions about your qualifications. Answer customer questions. Answer a supervisor's questions about your job performance.	Answer questions about your position on public issues. Answer questions of a census taker. Answer questions as a witness.	Answer a doctor's questions about an illness you have. Answer a tax auditor's questions. Answer a child's questions so that the child understands.

(Figure 1 Continued)

F. Give concise and accurate directions.	Direct co-workers or subordinates in performing unfamiliar jobs. Instruct customers about product use. Instruct an employee about improving job performance.	Give directions to another about the procedures necessary to vote. Give directions to another about the procedures necessary to file a tax return. Give directions to another about the procedures necessary to appear before the city council.	Teach your child how to play a game. Instruct repairpersons on how you want some repair made. Teach your child what to do in case of fire.
G. Summarize messages.	Summarize oral instructions given by your job supervisor. Give a summary of customer suggestions to your job supervisor. Summarize your qualifications in a job interview.	Summarize the position of a political candidate on a campaign issue. Summarize the arguments for and against a controversial issue. Summarize for another the laws/regulations pertaining to some action.	Summarize a public service message on auto safety. Summarize for family members a telephone conversation. Summarize for family members the family financial position.

What Should Be Assessed?

IV. *Human Relations*. This set of skills is used for building and maintaining personal relationships and for resolving conflict.

	Application Examples		
Competencies	Occupational	Citizenship	Maintenance
A. Describe another's viewpoint.	Describe the viewpoint of a supervisor who disagrees with your evaluation of your job performance. Describe the viewpoint of a co-worker who disagrees with your recommendations. Describe the viewpoint of union officials in a contract dispute.	Describe the viewpoint of a friend with whom you disagree about public issues. Describe the viewpoint of a legislator who proposes a law you oppose. Describe the viewpoint of a jury member with whom you disagree.	Describe the viewpoint of a retail store manager to whom you return merchandise. Describe the viewpoint of your spouse when you disagree on a major decision. Describe the viewpoint of your neighbor who complains about your children's behavior.

(Figure 1 Continued)

B. Describe differences in opinion.	Describe differences in opinion with co-workers about work related issues. Describe differences in opinion with your supervisor about the steps necessary to accomplish a goal. Describe differences in opinion with customers about product performance.	Describe differences in opinion with a legislator about proposed legislation. Describe differences in opinion with other jurors. Describe differences in opinion in a zoning hearing.	Describe differences in opinion with spouse about child rearing practices. Describe differences in opinion with your doctor regarding health care. Describe differences in opinion with spouse about the responsibility for household chores.
C. Express feelings to others.	Express personal reactions to changes in job conditions to your supervisor. Express satisfaction to a co-worker about his/her work. Express feelings of dissatisfaction with co-workers regarding the quality of work interactions.	Express feelings of anger to your city councilperson. Express your positive reactions to an elected official's work. Express feelings of disapproval regarding a legislator's position.	Express dissatisfaction to a store clerk. Express feelings of approval to your child for his/her school achievement. Express feelings of sympathy to a friend whose parent has died.
D. Perform social rituals.	Introduce yourself at the beginning of a job interview. Greet customers. Conclude a conversation with your employer.	Introduce a motion at a public meeting. Request an appointment with an elected official. Introduce a speaker at a political rally.	Make small talk in casual social settings. Introduce strangers to one another. Introduce yourself.

Application of the Minimal Speaking and Listening Competencies

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Editors' Note: *Clarice Lowe walks us through one approach to implementing the Speech Communication Association's "Guidelines for Minimal Speaking and Listening Competencies for High School Graduates." Taking one of the competencies from the list provided at the end of the preceding paper, she gives an example of one approach to instructional planning. Her example takes both conceptual and experiential perspectives as she moves to levels of greater detail, ending with a potential classroom activity. Dr. Lowe's discussion and examples emphasize the importance of the students' practicing communication after the basic concepts are presented.*

The current emphasis in educational programming is on life-orientation and functional skills. Teachers are being urged to design content and methods of instruction that develop students' ability to perform at adequate levels those tasks required of functioning and contributing members of our society. Although the identification of these tasks may vary from one content area to the next and among theorists within a content area, the tasks themselves are designed to build upon the characteristics of our society and those factors which serve to make an individual truly functional within his or her day-to-day environment.

Competency-Based Instruction in Oral Communication

In the area of oral communication the same programming emphasis is increasingly reflected in approaches to instruction. In 1977 a Speech Communication Association task force was charged with recommending minimal speaking and listening competencies needed by adults "from all regions of the United States, from all cultural and economic origins and with all career and life goals" to achieve "typical purposes in adult life" (Bassett, pp. 296-297).

Three criteria were used by the task force in selecting competencies. (1) Skills must be functional — capable of application for occupational, citizenship, and personal maintenance purposes. (2) Skills must be educational — capable of development by instruction. (3) Skills must be general — needed by all adults. The competencies selected were then grouped as

1. Communication codes — those skills which deal with minimal abilities in speaking and understanding spoken English and nonverbal signs.
2. Oral message evaluation — those skills which involve the use of standards of appraisal to make judgments about oral messages or their effects.
3. Basic speech communication skills — those skills which deal with the process of selecting message elements and arranging them to produce spoken messages.

4. Human relations — those skills used for building and maintaining personal relationships and for resolving conflict. (Bassett, 1978)

The full list of competencies is included in the paper by Fred Jandt elsewhere in this handbook.

Instructional approaches in oral communication, as in other subject matter areas, can emphasize either skills practice or behavior that requires the application of the skills. In actual practice, teachers generally combine these emphases rather than attempting either emphasis in its pure form. Ideally, the extent to which either is stressed should depend upon such considerations as the academic level of the students, their individual needs and capacities, the teacher's own preparation, and the resources available to the teacher. In any event, the focus in developing competencies should be on learning — on expanding students' abilities to understand and cope with their environment — rather than on standardizing performance or its assessment.

In order to realize this goal, teachers must recognize the fact that the achievement of competencies in oral communication has both a conceptual and a behavioral (experiential) base. Further, the integration of conceptual and experiential learning can be achieved through thoughtful curriculum design, providing numerous options for both teaching and learning. The results of this integration can be the enhancement of both the acquisition of individual skills by students and their mastery of more complex groupings of skills, known as competencies. The following discussion suggests two approaches to the integration of conceptual and experimental instruction using as an illustration one competency from the Speech Communication Association's "Guidelines for Minimal Speaking and Listening Competencies for High School Graduates."

Learning of Concepts

The first approach to the effective implementation of learning in oral communication is designed to strengthen the student's conceptual base. It allows the student to master information concerning the nature of the desired behavior using progressive learning levels. Following Bloom's (1956) theory of cognitive learning, information is presented so that the student progresses from simple to complex learning levels. These levels are recall and recognition, comprehension, application, analysis, synthesis, and evaluation.

The following illustration applies this progression to a competency from the third group of competencies (basic speech communication skills) in the "Guidelines," "Organize (order) messages so that others can understand them." This example deals only with topical and chronological ordering.

Learning Level		Skill
Simple	1. Recall and recognition	To be able to state definitions of topical and of chronological order which include the essential characteristics of each.
	2. Comprehension	To be able to classify examples of topical and chronological order.
	3. Application	To be able to phrase examples of topical and chronological order.
	4. Analysis	To be able to identify instances of topical and chronological order in messages.
	5. Synthesis	To be able to phrase messages including both topical and chronological order.
Complex	6. Evaluation	To be able to apply the essential characteristics of both topical and chronological order in testing the presence of each in messages.

It is helpful if these levels of learning can be explained to students as they progress through them. There is a definite morale factor existing in the knowledge students will have that they are gaining in their ability to think and reason critically. In addition, if this progression is applied consistently, students can experience a conscious carryover of their abilities into other content areas as well as into real-life situations.

Experiential Learning

The second approach emphasizes experiential contexts for skills mastery. It is possible for students to learn skills in isolation, but in order for students to master those skills they must learn them within a context that gives the students responsibility for their selection, comprehension, application, analysis, synthesis, and evaluation. Some educators go so far as to say that all communication learning is necessarily experiential and must take place by means of experiences structured in communication contexts. They reason that a person can learn the rules of a game, that is, the behaviors that are expected, without knowing how to play the game, without understanding how those behaviors are habitually used or how to develop new ways of using them (Conville, 1977, pp. 114-115). Also, active participation in learning makes it easier to understand abstract processes — for elementary, middle school, and high school students alike.

Dewey established four criteria for meaningful experiential learning:

1. *Continuity of experience.* The learning experience must provide a link between earlier experience and probable future experiences.
2. *Recurring experiences.* The learning experience must provide a thread that links recurring experiences and affords an opportunity for analyzing the relationship between behavior and specific consequences.
3. *Action and reflection.* The learning experience should enable the learner to be detached enough to reflect upon the experience and then to reconstruct it as activity or concrete referent.
4. *Emergence of subject matter.* Facts, concepts, and generalizations should emerge from the learning experience as the learner sees how his experience already contains within itself these basic facts, concepts, and generalizations. (Chiarelott, 1978)

Using Integrated Instruction in the Classroom

Table 1 (an adaptation from Brooks, 1973, p. 41) illustrates how the conceptual and experiential bases can be integrated by means of the two approaches described: Bloom's progressive learning levels, and learning experiences which meet Dewey's criteria. The activities suggested serve to expand students' abilities in the first of the progressive levels, recall and recognition.

The activities listed in the column "Continuity of Experience" are phrased in such a way that they identify the basic nature of the activity. This phrasing can be changed to adapt the activities to the age, grade level, or experiential level of the students. Similar modifications can be applied to the activities in the remaining three columns — activities can be increased in complexity or further simplified to meet the needs of the particular situation.

Most of the activities can be done by students individually, with feedback from class discussions, the teacher, or both. More interaction can be obtained, however, if these activities are carried out in groups. Group leaders can be appointed or may emerge or even be "voted on" as the activity progresses.

An Example of Integrated Instruction

The following example expands on an activity from Table 1. Under "Define topical order," in the "Action and Reflection" column, students are asked to "take an assortment of miscellaneous objects and group them according to characteristics that they have in common." The description below gives the specifics on how that activity might be conducted in the upper elementary grades.

Objective: To give students experience in creating organization (order).

Activity: Have the students take an assortment of miscellaneous objects and group them according to characteristics that the items have in common.

Materials: A box of miscellaneous objects: pencil, marbles, key, eraser, chalk, cotton ball, scissors, etc. (Decide on possible categories for grouping in advance and be sure that at least two items will fit into each category.)

Directions: Divide the class into small groups. (Put as many students in a group as there are possible categories for grouping the objects.) A student in each group volunteers to sort the objects in the box as the other students watch

Table 1. Competency: Organizing (Ordering) Messages So That Others Can Understand Them

Conceptual Base	Activities Providing			
	Continuity of Experience	**Recurring Experiences**	**Action and Reflection**	**Emergence of Subject Matter**
Knowledge	Use a familiar social group — family, school, government, etc. — as basis for activities.			
Define order	1. Name the members of the group and describe their roles.	Name the groups that you belong to in which members are assigned tasks.	Draw your family tree. or Locate and reproduce a chart showing the organization of your local (state, federal) government.	The concept of order
	2. List as many tasks as possible performed by the group.	Name groups that you can think of in which members are assigned tasks.	Simulate a group situation in which tasks are described and assigned.	
	3. Is there a reason that particular tasks are assigned to particular members?			
	4. Do certain members have certain kinds of tasks to perform?			
Define topical order	5. State purposes that these tasks serve.	Name ways in which pupils can be grouped in school (e.g., sex, age, grade).	Take an assortment of miscellaneous objects and group them according to characteristics that they have in common.	The concept of topical order
	6. Group under each purpose the tasks that relate to them.	State where you would fit into each group.	Simulate a situation in which individuals have to be grouped so that they can produce a talent show.	
Define chronological order	7. What tasks must be performed before others can begin?	"Set the stage" for activities that you commonly engage in (e.g., going to bed or getting up, studying).	Make a list of your daily activities from breakfast through dinner. or Keep a daily diary for a week. or Write a brief autobiography.	The concept of chronological order
	8. Arrange these tasks showing the order in which they must come from first to last if the purpose is to be accomplished.	Explain how you do chores you dislike and how you do things you particularly enjoy.		
Define problem — cause — solution order	9. Check and "back-check" the task order to determine what problems could occur if any task is omitted or only partially completed.	List changes that have occurred in you during the past year and their effects.	Simulate a situation in which the father is explaining to the members of his family why allowances must be cut.	The concept of problem — cause — solution order
	10. List possible remedies to the omission or partial completion of a particular task.	List changes that have occurred in your neighborhood (school, city) during the past year and give the reason for the change.	Continue the simulation by depicting how the members of the family decide upon a way to help the family budget.	

without helping. When all objects have been used, the student explains to the others in the group the basis for the arrangement — by color, by use, by materials they are made of, and so on. Other students may question, disagree, or suggest changes, if they wish.

Another student volunteers, using a different basis for arranging the objects. When the possibilities have been exhausted, the class reassembles to discuss the experience and the concepts learned, for example, order, topical order, and illogical or overlapping categories.

Follow-up:

1. Describe any object in the group. Now describe another object. Are you describing them in the same ways? How many features are you describing? Color? Size? Materials they are made of? Shape? Use? What others?
2. How did you decide how to arrange the objects into groups? Did you make a choice that would not work for all? Why wouldn't it work? Did you try to place an object into more than one group? What happened? Were you undecided about what group a particular object should go in? Why? What did you finally do?
3. How many different choices for grouping the objects did the members of your group use? Name the characteristic that determined each choice.

This activity can be made more complex in several ways. The sorting of objects could be done by the group as a whole, thus demonstrating the dynamics typical of a problem-solving group. Another variation could have the group address communication functions as well as the specific competency. For example, the number of students in each group could be increased so that one student would serve as recorder/reporter and another as observer/reporter. The recorder/reporter would give the entire class a chronological report of what took place within the group; the observer/reporter would describe the dynamics within the small group — nonverbal cues, the roles played, the method used to identify the leader, and so on. In this way, the class could also study the communication functions of informing and controlling (Allen and Wood, 1978).

Complexity should not be added for the sake of complexity, however. Nor should so much be added that the original focus of the learning experience is lost. The variations described above merely underscore the fact that communication is learned through acts of communicating. A well-planned activity can be modified, depending upon the students' level of development, so that one or more concepts can be explored.

The example which follows is an adaptation of the previous activity so that it is suitable for secondary students.

Objective: To give students experience in creating organization (order).

Activity: Have the students take a list of the tasks necessary for the production of a school-wide talent show and group them by the several production functions which the tasks have in common.

Materials: Chalkboard, chalk

Directions:

1. Ask two students to serve as recorders at adjacent chalkboards. They will alternate in recording student responses.
2. Explain the problem to the class: there is to be a school-wide talent show, and it is the responsibility of the class to plan the show. In a brainstorming session the class is to make a "shopping list" of the things that must be done through the night of the show. All responses are significant and should be recorded.
3. When the class has exhausted its resources, it must then arrange these tasks into groups according to the production functions that these tasks serve. The students will probably need some prompting in order to understand the basis for grouping — "production function."

   Consider this approach as one possibility for the teacher: "Among the many items on the board, you have listed duties like 'timing each act,' 'seeing that props and equipment get moved on and off stage,' 'giving performers their cues to go on stage,' 'arranging the sequence of acts,' and so on. Do you know the title given to the person in the theatre who has these responsibilities?" The students may know the answer, "stage manager," if they have had previous theatre experience. If probing does not appear productive after a point, the teacher may wish to supply the answer.

Once the label "stage manager" has been determined, the questioning can proceed: Why is he or she called a manager? What does "managing" mean? What do managers do? Can you identify those duties from the "shopping list" which fit this production function?

4. The class may be divided into groups at this point with instructions to group together other duties from the "shopping list" using a specific production function as a basis, for example, publicity and ticket sales, stage decorating and lighting, and so on. The groups may proceed in one of two ways. They may name a production function while checking sample duties against it to see whether or not there is a "fit." Or the groups may examine the list for related duties and arrive at a label for each category *after* grouping the duties, as was done with "stage manager."

   As the teacher interacts with individual groups, he or she can aid each in moving into the approach that will work better for the emerging dynamics and thought patterns of the group.

5. When each group has placed all items on the list in a category, the class reassembles to discuss the experience and the concepts learned, for example, order, topical order, and illogical or overlapping categories.

Follow-up:

1. List the category labels, that is, the production functions, which were used. Did each group list the same ones? If not, what features accounted for the differences? Within each group what characteristic is common to all category labels, for example, the people involved? Materials involved? Finances involved?

2. How did group members decide to arrange the items into categories? Did they choose labels that would not work for all items? Why wouldn't they work? Did they try to place items into more than one category? What happened? Were they undecided about what category a particular item would go into? Why? What did they finally do?

It is apparent that a progression into the concept of chronological order is not an easy one. Not only must the students understand what needs to be done in order to produce a successful talent show; they also need to determine the chronological sequence of duties so that a goal can be reached. Other modifications are also possible, depending upon the concepts the teacher wishes to explore.

Cautions Concerning the Use of Integrated Instruction

The greatest benefit that can be derived from the use of experiential learning in the classroom is that students will be able to explore their feelings during the activity, and they will become more aware of their thought processes. These feelings and thoughts are better recognized and examined when students are able to verbalize them and to give them labels. Therefore, examination and discussion of the experience should follow immediately upon the conclusion of each activity.

It is important that the teacher guide this "discovery," probing gently rather than telling the students what he or she thinks happened or should have happened. The teacher's sensitivity in summarizing and synthesizing the group experiences is equally important. This is often a new and difficult role for teachers accustomed to being assertive and "in control." However, the mutually gratifying results reward and reinforce this role.

Training teachers to define competencies explicitly and comprehensively, rather than to use vague and sometimes ill-defined objectives, is a difficult task but is becoming more and more widespread. It is not easy to design a curriculum in oral communication, or to identify and describe the various levels of competency. The integrated approach is also difficult to master, because it calls for both vertical and horizontal tracking. That is, each activity progresses from simple to complex learning levels and each must also meet the four criteria for experiential learning. An added difficulty is ensuring consistency within and across activities.

It is clear that initial planning requires time, care, and adequate resources for the individual teacher, the team, or the curriculum committee developing the curriculum. Such careful planning will result in experiences that keep the needs, capabilities, and backgrounds of the students in mind. This will be turn result in a high degree of student involvement and a corre-

sponding increase in students' ability to think critically and creatively and to master the full range of oral communication skills. This mastery will carry them a great way toward becoming functioning and contributing members of our society.

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Mathematics

Overview: *The three papers in this section examine ten categories of basic mathematics skills. Marilyn Suydam reviews results of research studies which have focused on computation and nine other mathematics skills. She introduces the case for expanding mathematics instruction beyond computation. Ross Taylor uses the recommendations of three professional mathematics associations to explore the implications of a broader view of mathematics instruction. In the third paper Alan Hoffer provides suggestions on how to teach insight as part of problem solving in mathematics.*

Basic Skills in Mathematics: The Issue Regarding Computational Skills

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Editors' Note: *Marilyn Suydam reviews the research and other literature on instruction in computation and other areas of mathematics. She then explores the issue of whether mathematics instruction should include only computation or should also include a broader range of mathematics skills. Dr. Suydam discusses six factors which influence mathematics instruction: needs of daily life, tradition, prerequisites for later study, declines in achievement scores. availability of calculators, and capabilities of teachers. She then considers the implications of those factors for curriculum content and instructional methods. The paper includes the ten "Tenets on the Teaching of Computation."*

Introduction

Most discussion of basic skills in mathematics center on the role that computational skills play in mathematics instruction. Many people equate mathematics with computation and have relatively little difficulty identifying the computational skills which a person must have to be considered competent in mathematics.

Other people feel that an emphasis on computational skills is inadequate for preparing students for their futures. They believe that other mathematical ideas have assumed increasing importance and must, along with computational skills, be considered basic skills.

The purpose of this paper is to explore this issue: the content distinctions for the curriculum, the factors to consider on each side, and, finally, the implications of and for educational practice.

Content of Basic Skills in Mathematics

If the basic skills in mathematics consist only of computational skills, then the emphasis is on the following:

1. Addition, subtraction, multiplication, and division with whole numbers, including
   - A mastery of the basic facts, such as $9 + 7 = 16$, $12 - 4 = 8$, $2 \times 5 = 10$, and $27 \div 3 = 9$.
   - The ability to compute with multidigit numbers, using a paper-and-pencil procedure (called an algorithm), such as

$$\begin{array}{r} 26 \\ \times 34 \\ \hline 104 \\ 78 \\ \hline 884 \end{array}$$

   - An understanding of certain generalizations related to computation, such as $3 + 7 = 7 + 3$, $9 - 0 = 9$, $8 \times 1 = 8$, and "$12 \div 0$ is undefined."
2. Addition, subtraction, multiplication, and division with common fractions (for example, $\frac{1}{4} + \frac{1}{2} = \square$).

3. Addition, subtraction, multiplication, and division with decimal fractions (for example, $7.2 \times 3.8 = \square$).

Certain other skills contribute to mastery of these computational skills. Place-value skills (for example, knowing that in 37 the 3 is in the tens place) is an important example. Algorithms for each operation depend on an understanding of place value. Thus, to add 377 + 59, the student must realize that ones must be added to ones and tens to tens; that the vertical form

$$\begin{array}{r} 377 \\ +\ 59 \\ \hline \end{array}$$

facilitates the addition of ones, tens, and so on; that the sum of 7 and 9, 16, is 1 ten and 6 ones, and therefore 1 ten is added with 7 tens and 5 tens. Without understanding place value, the student must strive to commit to memory an algorithm whose steps seem arbitrary. Why not write 377 + 59 as shown in *a* below, or why not multiply 46 and 32 as shown in *b*?

(a)
$$\begin{array}{r} 377 \\ +59 \\ \hline \end{array}$$

(b)
$$\begin{array}{r} 46 \\ \times 32 \\ \hline 812 \\ 1218 \\ \hline \end{array}$$

Place-value skills help to provide the answers to such questions. They are seldom identified as "basic skills," yet they may be more basic than many others. However, the key role which this skill and other skills, such as numeration, play in learning mathematics is not always recognized, and they are tested sparingly.

An increasing number of people believe that the basic skills in mathematics consist of more than computational skills. The list of skill areas developed by the National Council of Supervisors of Mathematics (NCSM, 1977) and endorsed by the National Council of Teachers of Mathematics (NCTM) in 1978 is the one most frequently cited:

1. Problem solving
2. Applying mathematics to everyday situations
3. Alertness to the reasonableness of results
4. Estimation and approximation
5. Appropriate computational skills
6. Geometry
7. Measurement
8. Reading, interpreting, and constructing tables, charts, and graphs
9. Using mathematics to predict
10. Computer literacy

NCTM's *An Agenda for Action: Recommendations for School Mathematics of the 1980s* reinforces the Council's endorsement. One of the eight recommendations states that "the concept of basic skills in mathematics must encompass more than computational facility" (NCTM, 1980, p. 5). Furthermore, the belief is expressed that acceptance of a wide variety of basic skills must occur "if we are to design a basic skills component of the curriculum that enhances rather than undermines education" (NCTM, 1980, p. 5). (The above list of basic mathematical skills and the recommendations of *An Agenda for Action* are discussed further by Ross Taylor in the next paper.)

Factors to Consider

Many reasons are given for supporting one or the other side of the issue. These reasons fall into at least six categories: (1) needs of daily life; (2) tradition; (3) prerequisites for later study; (4) declines in achievement scores; (5) availability of calculators; and (6) capabilities of teachers. Each of these factors will be considered in additional detail in this section.

Needs of Daily Life

The "Priorities in School Mathematics" (PRISM) project surveyed over 3000 teachers of mathematics at all levels from kindergarten through college, mathematics supervisors, mathematics teacher educators, principals, school board members, and parents. Ninety percent of those who placed computation highest on the list of priorities for curriculum development in the 1980s supported the statement, "Computational skills are absolutely crucial" (Osborne et al., 1980).

This belief in the importance of computational skills seems to stem largely from the notion that computational skills are vital in everyday, real-life situations. People see computation being used daily — or at least believe they

see it being used when numbers are involved, whether at home, in stores, or elsewhere.

Those who argue for extending the curriculum beyond the computational skills point out that

> the changing needs of society, the explosion of the amount of quantitative data, and the availability of computers and calculators demand a redefining of the priorities for basic mathematics skills. (NCSM, 1977, p. 1)

They note that computation is not used as frequently as estimation, measurement, and other skills. Moreover, the ability to *apply* computation in solving problems is vital:

> The need of the student to deal with the personal, professional, and daily experiences of life requires a curriculum that emphasizes the selection and use of these skills in unplanned, unexpected settings. (NCTM, 1980, p. 2)
>
> . . . a citizen who cannot analyze real-life situations to the point of recognizing what computations must be made to solve real-life problems has not entered the mainstream of functional citizenship. (NCTM, 1980, p. 6)

Supporters of an expanded definition of basic skills argue that, in a world in which machines can compute more accurately than people can, people should be learning to do what machines cannot do (at least as yet): think.

Tradition

Computational skills are traditional components of mathematical competency. "What I learned in school is what my children should learn" is rarely said so bluntly, but it is the basis for many arguments about why computational skills should continue to be taught. Tradition plays a large part in shaping American education, and it affects mathematics particularly. Some of the dissatisfaction with the "new math" arose because children were not learning "how to do things the way they should be done." For instance, the changed procedure for doing long division was not considered "right."

Others point out that the world has changed dramatically in the past thirty years, that the technological revolution is having an impact at least as great as that of the industrial revolution in the last century. They believe that children must learn the mathematics which will enable them to cope with the changes technology has brought and will continue to bring:

> It is dangerous to assume that skills from one era will suffice for another. Skills are tools. Their importance rests in the needs of the times. Skills once considered essential become obsolete, and this is likely to increase in pace and scope as advances in technology revolutionize our individual, social, and economic lives. Necessary new skills arise from the dimensions of the mathematics pertinent to an age of population explosion, space exploration, economic and fiscal complexity, and microelectronic wonders. Time and space for including these new skills in the curriculum must be purchased by eliminating the obsolete. (NCTM, 1980, p. 6)

Prerequisites for Later Mathematics

The view that students need to master computational skills in order to be able to do more mathematics is expressed by people who believe that computational skills are essential to the study of algebra, calculus, or any other mathematics.

Others (including many mathematicians) view computation as "trivial." They argue that most mathematical thinking is not based on computational skills but involves the ability to handle abstract quantitative and spatial ideas. Computation is viewed simply as a hurdle — until computational skills are mastered, most students are not allowed to go on to study any more mathematics. Many students become discouraged, lose interest in mathematics, and are excluded from a wide range of vocations for which work in mathematics is essential:

> When a student discontinues the study of mathematics early in high school, he or she is foreclosing on many options. Many doors, both in college programs and in vocational training, are at once closed to that person. (NCTM, 1980, p. 17)

Declines in Achievement Scores

The news media have reinforced the idea that students today are generally weaker in basic computational skills than students used to be. "The schools have not been placing sufficient emphasis on computational skills," argue some people. They point to decreases in scores on the Scholastic Aptitude Test (SAT) and other tests

(Harnischfeger and Wiley, 1975). The "new math" is said to have had an adverse effect on the learning of computational skills — textbooks and new instructional techniques are viewed as ineffective.

Other persons point to fallacies in these claims. They note that an investigation into possible causes for declines on the SAT and other tests indicated that no single cause could be identified. The contributing factors are closely bound to a number of societal changes, and "the national picture is far more varied and complex than either proponents or critics of recent curricular innovation suggest (NACOME, 1975, p. 199). They also call attention to data from the two mathematics assessments conducted by the National Assessment of Educational Progress (NAEP). On both the first assessment in 1972-73 (Carpenter et al., 1978) and the second assessment in 1977-78 (NAEP, 1979), the data showed that student performance was generally high for whole-number computation (and some other topics), but that performance with fractions and with applications of computational skills in problem solving was very weak. Carpenter et al. (1975) noted:

> The modern mathematics movement of the 1960s has been accused by its critics of destroying pupils' computational skills. These NAEP mathematics data argue that whole-number computation is not a lost art and, in fact, 13-year-olds perform at about the same level as adults [and 17-year-olds perform better]. (pp. 449-450)

Bright (1978) compared data from a number of assessments for which data were reported on an item-by-item basis for computational examples. His analysis indicated that (1) performance improved as grade level increased; (2) performance decreased as test items became more complex; (3) performance tended to stabilize during the junior high school years, with 80-90 percent of the students reaching mastery; and (4) performance on computation with whole numbers stabilized earlier, and at a higher level, than on computation with fractions. Bright concluded that

> computational skills are not acquired on the basis of initial instruction. Instruction over several years is needed to reach stability, and in every area examined there is still room for improvement. ... [T]he data presented refute the notion that students generally do not acquire basic computation skills. In fact, some skills (e.g., addition and subtraction without regrouping) are almost universally acquired, whereas others (e.g., division of decimal fractions) are not. Any meaningful discussion of the performance of students in basic computational skills must be a discussion of specific skills rather than skills in general. (p. 160)

Notions about the extent to which computational goals have been attained vary. It is apparent from the evidence, however, that *particular* computational skills need greater emphasis, rather than *all* computational skills.

Availability of Calculators

In several studies (for example, Osborne et al., 1980), 80 percent of those surveyed indicated that they believe that children must continue to learn paper-and-pencil computational skills, *along with* the use of calculators if not *before* calculators are used. Several other studies have had similar findings. There is distrust on the part of many persons that computational skills cannot and will not be properly learned unless the written procedures are used.

Few people believe that paper-and-pencil procedures should be eliminated, but some do advocate placing less stress on them, while placing far more emphasis on mental computation and estimation. They argue that such skills seem vitally needed in everyday life, while paper-and-pencil computation is actually used very little.

Few people believe that paper-and-pencil procedures should be eliminated, but some do advocate placing less stress on them, while placing far more emphasis on mental computation and estimation. They argue that such skills seem vitally needed in everyday life, while paper-and-pencil computation is actually used very little. Moreover, calculators remove the drudgery from tedious calculations, lessen the need for memorization, and place emphasis on when and what operation to use rather than merely on how to perform the paper-and-pencil algorithm correctly (Suydam, 1976, pp. 13-16).

The extent to which paper-and-pencil computation should be mastered needs to be reexamined. Recommending the use of calculators at all levels, the NCTM *Agenda* states:

> Common sense should dictate a reasonable balance among mental facility with simple basic computations, paper-and-pencil algorithms for simple problems done easily and rapidly, and the use of a calculator for more complex problems or those where problem analysis is the goal and cumbersome calculating is a limiting distraction. (p. 6)

In connection with a recommendation on effectiveness and efficiency, note is made that

> There are certain algorithmic skills (e.g., long division with multi-digit divisors) that require a great expenditure of classroom time. A strict standard of time-effectiveness and cost-effectiveness should be applied to determine whether actual use of that technique in life outside school justifies this much expenditure of effort and time. The use of calculators has radically reduced the demand for some paper-and-pencil techniques. (p.12)

The research evidence indicates that paper-and-pencil skills are not lost when calculators are used. In virtually all of approximately 100 studies, students who used calculators for instruction achieved at least as high or higher scores than students not using calculators, even though the calculators were not used on the test (Suydam, 1980). The decrease in time spent on paper-and-pencil practice did not appear to harm the achievement of those students who used calculators. Moreover, calculators can facilitate the learning of basic facts and other mathematical ideas.

Capabilities of Teachers

Finally, some people fear that, given the low level of mathematical background of many elementary teachers, no mathematics will be taught if the role of computation in the curriculum is downgraded — or, perhaps worse, that instruction on other mathematics skills will be poor, misleading, or just plain incorrect.

Opponents of this view argue that elementary teachers can teach other content if given encouragement and approval for doing so by parents, school boards, and administrators. Teachers are capable of learning new content and new methods of teaching. But the rationale for change must be clear, and the support network must be well developed.

Implications of Current Educational Practice

What are the implications of the six factors considered in the previous section? To answer that question, consideration must be given to the current curriculum and to current instructional practices.

Curriculum Content

Several recent studies (NACOME, 1975; Stake and Easley, 1978; Suydam and Osborne, 1977; Weiss, 1978) have provided evidence confirming the belief that the elementary school mathematics program is devoted primarily to helping children learn to compute. Indeed, computational skills are the focus of most programs through grade 8 and of many general mathematics programs, through grade 9 and sometimes beyond. Despite the variety of content in textbooks and curriculum guides, other topics "are most often skipped in favor of more time to develop computational skills that are comfortable to and valued by elementary teachers" (NACOME, 1975, p. 11).

The devotion to computational skills prevailed throughout the "new math" era. Much publicity and a few surface changes in curriculum occurred, yet the evidence indicates that most teachers continued to focus on computational skills despite pressures for change. Calls now for a "return to the basics" in mathematics raise the question of whether we can return to what we possibly never left.

To effect a change in the elementary school curriculum requires a long-term assimilation process, one that is more likely to occur by evolution than by revolution. Two elements must be present to facilitate that process: (1) a strong commitment by all concerned in the educational process, especially by teachers and parents; and (2) major efforts to aid the teacher in effecting change. Clearly, such efforts must focus, at both the preservice and inservice levels, not only on the development of a curriculum in tune with a broader thrust, but also

on how that curriculum is to be taught. Instructional methods must undergo change in much the same manner as the curriculum must evolve.

Instructional Methods

For the past 30 to 40 years, including the period in which "new math" was developed, teaching methods have revolved around the idea of developing meaning or understanding. Currently, there is pressure to return to the mechanistic drill procedures common prior to 1940. Recently published textbooks contain far more drill-and-practice pages than they have for some years. The accountability movement has resulted in a high level of teacher concern about having students master computational skills.

To effect a change in the elementary school curriculum requires a long-term assimilation process, one that is more likely to occur by evolution than by revolution.

Moreover, drill is simpler for teachers to administer than meaningful instruction (for instance, using manipulative materials to develop meaning is particularly difficult for many teachers to manage). It seems apparent that many persons do not realize that there were sound reasons for the change from drill-oriented methods to meaningful methods, not the least of which was lack of success, as measured by achievement tests.

Even though massive effort was devoted to it during the heyday of drill in the 1920s and 1930s, 100 percent mastery by drill methods proved an impossible goal to attain, even by its strongest proponents (e.g., Guy Wilson, 1930). There is evidence from research that drill methods have a short-term payoff: students taught by drill can pass immediate tests with higher scores than those taught by meaningful methods. But those taught by meaningful methods will probably score higher than drill-taught students on tests of transfer and retention (Weaver and Suydam, 1972). Are these two major goals of instruction, the goals of helping students apply knowledge in new situations and retain knowledge over a long period of time, worth foregoing in order to attain mastery of content more amenable to drill methods?

Similar concern about instructional methods was indicated in the NACOME Report (1975):

> Conceptual thought in mathematics must build on a base of factual knowledge and skills. But traditional school instruction far over-emphasized the facts and skills and far too frequently tried to teach them by methods stressing rote memory and drill. These methods contribute nothing to a confused child's understanding, retention, or ability to apply specific mathematical knowledge. Furthermore, such instruction has a stultifying effect on student interest in mathematics, in school, and in learning itself. (p. 24)

The balance that is needed between meaningful instruction and practice has not yet been realized. A survey of teachers conducted by an NCTM committee (Denmark and Kepner, 1980) indicated that just over half of those responding believe that basic skill mastery should *precede* the development of concepts and applications; an equivalent number indicated that mastery should be attained *while* teaching concepts and applications. Only 14 percent thought that mastery of basic skills should *follow* the development of concepts and applications. Yet the point made by research studies is that drill should follow meaningful instruction (Weaver and Suydam, 1972).

The point made about children's attitudes in the last quotation should also be considered. Studies that have considered how children react to the way in which they are taught mathematics provide discouraging reading. Erlwanger (1974) described misconceptions of six children using an individualized mathematics program, while Lankford (1972) presented interview data on the errors made by 176 seventh-grade students doing whole-number and fraction computation. It appears that, all too frequently, the clarity of computational procedures is lost; the children focus instead on getting the answer the teacher or printed materials says is right — or simply getting *some* answer. Even answers that make no sense seem to children to be better than no answers or than answers that disagree with what teacher or text says is right. It is obvious from such evidence that a change in instructional methods is needed, not merely a shift away from "too much drill."

It is also clear from the research evidence that there is no *one* instructional method that is most effective (Suydam and Weaver, 1975). The NCTM *Agenda* also recommends that

> Teachers should use diverse instructional strategies, materials, and resources, such as individual or small-group work as well as large-group work; well-planned use of media . . .; the provision of situations that provide discovery and inquiry as well as basic drill; the use of manipulatives, where suited, to illustrate or develop a concept or skill; the inclusion of cyclic review of past topics (contents, skills, and ideas previously taught); and the use of materials and references outside the classroom. (pp. 12-13)

To effect a change in instructional methods demands the same type of commitment from teachers that a change in curriculum content demands. It also demands a change in the way in which preservice teacher education programs are focused and a change in the type of inservice help given to teachers. Teachers need to build a repertoire of methods that can be applied as particular content is taught to particular children, considering the needs of the content in relation to the needs of the children and selecting the method that is best suited to reaching each goal. Drill has a place in this repertoire of strategies, just as computational skills have a place in the curriculum: to make drill the sole focus of the curriculum is to deprive children of the means to attain goals other than those that are drill-related. Thus, children need drill on basic facts after they have developed some understanding of the numerical ideas from which the facts were derived. But they also need lessons in which they search for ideas and clarify their understanding of the operations and the algorithms, and lessons in which they apply the algorithmic learning in problem-solving situations.

Conclusion

Several years ago, a set of ten "Tenets on the Teaching of Computation" was developed (Trafton and Suydam, 1975). The first four tenets address curricular concerns, while the following six are related to instructional concerns. Each tenet has been considered in this paper, either directly or indirectly.

1. Computational skill is one of the important, primary goals of a school mathematics program.
2. All children need proficiency in recalling basic number facts, in using standard algorithms with reasonable speed and accuracy, and in estimating results and performing mental calculations, as well as an understanding of computational procedures.
3. Computation should be recognized as just one element of a comprehensive mathematics program.
4. The study of computation should promote broad, long-range goals of learning.
5. Computation needs to be continually related to the concepts of the operations and both concepts and skills should be developed in the context of real-world applications.
6. Instruction on computational skills needs to be meaningful to the learner.
7. Drill-and-practice plays an important role in the mastery of computational skills, but strong reliance on drill-and-practice alone is not an effective approach to learning.
8. The nature of learning computational processes and skills requires purposeful, systematic, and sensitive instruction.
9. Computational skills need to be analysed carefully in terms of effective sequencing of the work and difficulties posed by different types of examples.
10. Certain practices in teaching computation need thoughtful reexamination. (p. 528)

Obviously, instruction on computational skills can be improved. It *must* be improved. But let us not forget that some children do obtain excellent instruction in computation and other basic mathematical skills. The ten tenets on the teaching of computation can provide guidance in improving computation instruction for all children.

The words of Shirley Hill, as President of the National Council of Teachers of Mathematics, should also be carefully considered:

> It struck me as supremely ironic that at the very time we are on the threshold of "teaching machines to reason" we are spending an inordinate amount of our education energies teaching our children mechanistic skills. (1979, p. 3)

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The Mathematics Education Profession's View of Basic Mathematical Skills

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Editors' Note: *Several professional associations of mathematics educators have worked intensively with their members to prepare three statements dealing with mathematics curriculum content, instructional methods, and program design. In this paper Ross Taylor, who was involved in the preparation of two of those statements, describes how they were prepared, summarizes their content, and discusses their implications for testing, instruction, and general improvement of mathematics instruction programs. In his discussion of implications he has given several examples from his own school district. The NCSM "Position Paper on Basic Mathematical Skills" accompanies his paper.*

Introduction

There is remarkable agreement within the mathematics education profession about major issues concerning basic mathematical skills. This point becomes vividly clear when one reviews positions taken by professional mathematics education organizations during the past several years. Three of these positions will be summarized in this paper. The first is the National Council of Supervisors of Mathematics (NCSM) Position Paper on Basic Mathematical Skills. The second is the Report of the Kansas City Coordinating Conference, which had representation from NCSM, the National Council of Teachers of Mathematics (NCTM), and the Association of State Supervisors of Mathematics (ASSM). The third statement is the NCTM publication, *An Agenda for Action: Recommendations for School Mathematics of the 1980s.* (The NCSM position paper is included at the end of this chapter. The other documents can be obtained from addresses given in the list of references.) The major part of this paper will be devoted to suggestions for implementing the recommendations on basic skills contained in these three statements.

NCSM Position Paper

By the middle of the 1970s, mathematics educators became concerned about the public pressure to go "back to the basics." There was a fear that this pressure could result in a narrow concentration on computation to the exclusion of the other important skill areas. Such a focus would be particularly inappropriate at a time when uses of calculators and computers were rapidly expanding. To deal with important basic mathematical skill issues, the National Institute of Education (NIE) sponsored a Conference on Basic Mathematical Skills and Learning, held in Euclid, Ohio, in October 1975. (The two-volume report on the conference contains over thirty papers contributed by leaders in mathematics education, as well as recommendations from

working groups at the conference.) In April 1976, during the annual meeting of the National Council of Supervisors of Mathematics, over 100 supervisors met to discuss the Euclid Conference Report. At that meeting, the supervisors called for the creation of a position paper on basic mathematical skills. With the help of funding from NIE, the paper was developed and published in January 1977. NCSM prepared a summary of the paper, which is included here.

> Mathematics supervisors are concerned that, as a result of the "back-to-the-basics" movement, today in many schools there is too much emphasis on computation and not enough stress on other important mathematical skills. To respond to this trend, the National Council of Supervisors of Mathematics (NCSM) set up a twelve-member task force to write a position paper on basic mathematical skills. The position was first written in July, 1976, and later revised on the basis of ideas from supervisors throughout the country.
>
> The position paper urges that we move forward, not "back" to the basics. The skills of yesterday are not the ones that today's students will need when they are adults. They will face a world of change in which they must be able to solve many different kinds of problems. The NCSM position paper lists ten important skill areas that students will need.
>
> - *Problem Solving:* Students should be able to solve problems in situations which are new to them.
> - *Applying Mathematics to Everyday Situations:* Students should be able to use mathematics to deal with situations they face daily in an ever-changing world.
> - *Alertness to Reasonableness of Results:* Students should learn to check to see that their answers to problems are "in the ball park."
> - *Estimation and Approximation:* Students should learn to estimate quantity, length, distance, weight, etc.
> - *Appropriate Computation Skills:* Students should be able to use the four basic operations with whole numbers and decimals and they should be able to do computations with simple fractions and percents.
> - *Geometry:* Students should know basic properties of simple geometric figures.
> - *Measurement:* Students should be able to measure in both the metric and customary systems.
> - *Tables, Charts and Graphs:* Students should be able to read and make simple tables, charts and graphs.
> - *Using Mathematics to Predict:* Students should know how mathematics is used to find the likelihood of future events.
> - *Computer Literacy:* Students should know about the many uses of computers in society and they should be aware of what computers can do and what they cannot do.
>
> The role of computation is put into its proper place. Long computations will usually be done with a calculator, but computation is still important. Mental arithmetic is a valuable skill. Computational skills by themselves are of little use, but when used with other skill areas they give the learner basic mathematical ability. School systems which try to set the same requirements for all students should beware of requirements which either are too difficult or which stress only low-level skills.
>
> Rather than using only a single method such as drill and practice for learning basic mathematical skills, many different methods should be used. Hands-on experiences with physical objects can provide a basis for learning basic mathematical skills. Standardized tests are usually not suitable for measuring individual student progress. Instead, the tests used should be made especially to measure the mathematical skills being taught.
>
> The NCSM position paper sets forth a basis for identifying which basic mathematical skills are important and for determining if students have learned these skills.

In her paper on computational skills, which precedes this paper, Marilyn Suydam notes that the NCSM position is frequently cited and that it was endorsed by the National Council of Teachers of Mathematics. The position has been widely disseminated and has received broad support from the mathematics education profession.

Kansas City Coordinating Conference

In the fall of 1978, the Office of Education Right to Read Program was in a period of transition. New legislation was replacing it with the Basic Skills Improvement Program, which included mathematics, writing, speaking, and listening in addition to reading. To seek input from the mathematics education profession, the

Office of Education sponsored the Kansas City Coordinating Conference. This October 1978 meeting included representatives of the national organizations of mathematics teachers and supervisors.

At the conference, participants expressed concerns of mathematics educators about the process of developing state plans for basic skills and identified issues and problems in the teaching and learning of basic mathematical skills. They were in unanimous agreement that basic skills instruction should emphasize all ten NCSM skill areas rather than focus narrowly on computation.

Participants were concerned that mathematics teachers, mathematics supervisors, and college mathematics educators should be involved in the planning process. Planning should also involve state and local mathematics education organizations affiliated with the National Council of Teachers of Mathematics. Teachers should have the benefit of services of mathematics specialists at the local, state, and national levels.

Basic skills plans should stress coordination of resources and avoid conflicting or overlapping programs funded from various sources. Programs should build upon existing support structures and avoid infusing another layer of bureaucracy with a possible counterproductive result. Teachers should not be faced with an extra management burden. The emphasis on basic skills should not limit opportunities for learning in the rest of the curriculum. The planning process should provide a means for establishing priorities and determining which programs should receive funding. In light of the past emphasis on reading, mathematics will need special extra attention in the immediate future.

There was agreement that mathematics concept development should proceed from physical model to representational to abstract. The relationship of language and mathematics should be emphasized. Parents should be effectively involved in the process of helping their children learn mathematics.

The key role of the teacher in successful instruction must be recognized. Funding must be found to provide levels of staffing necessary for effective instruction. Inservice should be provided to increase mathematical knowledge, eliminate mathematics anxiety, and provide instructional skills necessary to teach students who have not previously been successful in mathematics.

Participants agreed that there is a need for a systematic approach to skill development that (1) identifies goals and objectives; (2) develops an evaluation strategy that measures student achievement of these objectives; (3) develops and implements an instructional program; and (4) makes changes in the program and in individual instruction as found necessary from evaluation. They noted that existing commercially developed norm-referenced tests are not appropriate for these processes. They also expressed a need for a national clearinghouse to facilitate an exchange of information about local and state mathematics basic skills programs.

An Agenda for Action

The National Council of Teachers of Mathematics spent several years in the development of a set of eight major recommendations for school mathematics of the 1980s. These recommendations are realistic in their attention to hard data from studies funded by the National Science Foundation (NSF) and from two mathematics assessments of the National Assessment of Educational Progress. In addition, careful attention was given in their development to the results of an extensive survey of opinions of many sectors of society, both lay and professional. The survey, entitled "Priorities in School Mathematics" (PRISM), was funded by the National Science Foundation.

The recommendations, as detailed in *An Agenda for Action: Recommendations for School Mathematics of the 1980s*, are —

1. That problem solving be the focus of school mathematics in the 1980s;
2. That basic skills in mathematics be defined to encompass more than computational facility;
3. That mathematics programs take full advantage of the power of calculators and computers at all grade levels;
4. That stringent standards of both effectiveness and efficiency be applied to the teaching of mathematics;

5. That the success of mathematics programs and student learning be evaluated by a wider range of measures than conventional testing;
6. That more mathematics study be required for all students and a flexible curriculum with a greater range of options be designed to accommodate the diverse needs of the student population;
7. That mathematics teachers demand of themselves and their colleagues a high level of professionalism; and
8. That public support for mathematics instruction be raised to a level commensurate with the importance of mathematical understanding to individuals and society.

These recommendations have widespread support within the mathematics education community.

An Agenda for Action also expands upon each recommendation. For example, the discussion of the first recommendation on problem solving implies the need for a concentration of research and development in that area. The expansion of the second recommendation states that the full scope of what is basic should contain at least the ten basic skill areas defined by the NCSM position paper. Rapidly emerging technology implies the need for implementation of the third recommendation on use of calculators and computers. Recent research has indicated that use of calculators does not hurt student achievement. On the contrary, calculators can help (Suydam, 1979; Suydam, 1980).

Students need to recognize the importance of mathematics to their futures. In particular, females and minorities need to be given special encouragement to take more mathematics in order to keep their options open for careers and higher education.

Recommendation six calls for a flexible curriculum to meet the diverse needs of the student population. This is in contrast to a narrow focus on minimum competency. Students need to recognize the importance of mathematics to their futures. In particular, females and minorities need to be given special encouragement to take more mathematics in order to keep their options open for careers and higher education.

Basic Skills, the Profession and Present Practice

In his summary of three recent National Science Foundation studies, James Fey (1980) points out a disparity between the position of the profession and classroom practices:

> The most discouraging feature of the three NSF studies is the consistent pattern of great differences between apparent reality of mathematics education in most schools and the recommendations or practices of many prominent teachers, supervisors and professional organizations. For instance, it appears that a large majority of elementary teachers believe that their sole responsibility in mathematics teaching is to develop student facility in arithmetic computation — this at a time when availability of calculators has made such goals widely questioned. (p. 31)

It is true that, in spite of the broad support for an expanded definition of basic skills by professional mathematics educators, there are many schools and classrooms where there is still a narrow concentration on computation to the exclusion of the other skills. In some cases, this is due to a routine repetition of what has been done in the past, without careful consideration of which mathematical skills are needed by today's students. In other cases, teachers who have not received appropriate training or curriculum materials cling to computation like a security blanket. Both of these forces toward a narrow curriculum can be overcome by a rational reevaluation of which skills are important, followed by appropriate curriculum revision and staff development.

The broad concept of basic skills supported by the mathematics education profession has behind it the force of compelling logic and common sense. Rational consideration of which mathematical skills are basic inevitably leads to the expanded concept of basic skills. Usually, when educators, legislators, or the lay public argue for proficiency in computation and implicitly neglect the other mathematical skills, it is because they haven't given the issue careful consideration.

One of the problems is that "mathematics" is not a verb. When persons other than mathematics educators make statements about basic skills, they often talk about the ability to read, write, speak, listen, and compute. They use "compute" because it is a verb and because they haven't seriously thought about the issue. When the narrowness of the term "compute" is pointed out, they usually agree with the broader concept of basic mathematical skills.

In Minneapolis, we have had no difficulty convincing teachers that students should learn basic mathematical skills in all ten areas listed in the NCSM position paper. Whenever we discuss the issue with parent or community groups, they are supportive. The public is much more willing to rely on our "expert" advice than we had expected. The overwhelming sensibility of our position is a factor that gives us added credibility.

Objectives and Testing

Students, teachers, parents, administrators, and the community should all have a clear idea of which basic skills students are expected to learn. Basic skill objectives should stand the test of public scrutiny. Changes in objectives can be made when the changes are found to be desirable or necessary. Students will know what to study, teachers will know what to teach, and parents will be better able to help their children. We have found that precisely stated behavioral objectives are not an effective means of communicating with students, teachers, and parents unless the objectives are accompanied by sample test items. In many cases, sample tests are more effective in communicating objectives than lists of behavioral objectives.

While the NCSM position outlines the scope of basic skills, it does not precisely define exact skills. In keeping with the tradition of local control of education, specific skills should be determined at the local level on the basis of input from the staff and the community being served. If skills are determined at the state level, professional educators and lay citizens should be involved. In either case, assistance should be sought from leaders in mathematics education.

It is essential that the testing program match the objectives. One of the most efficient procedures for developing the objectives and the testing program is to have the initial development or selection done by a small task force. This task force should consist of teachers who have shown leadership in mathematics education and specialists in mathematics education. These specialists can come from within the school system or from outside sources such as the state department of education or higher education. All teachers of mathematics should have the opportunity to review the objectives and testing program and to provide suggestions for modification. Lay community members, including parents and possibly students, should also have the opportunity to participate in the process. Support of the process by school administrators and the school board is important. Persons involved in the process of determining objectives will feel some ownership, and their commitment will contribute greatly to the instructional program. Groups such as the mathematics educators who gathered at Euclid, Ohio, in the fall of 1975 or mathematics supervisors who developed the NCSM position paper can propose guidelines for the determination of which skills are basic for all citizens. They have done that job very well. However, the final determination should involve the teachers who teach the skills, the administrators of the programs, and the community that is served.

At this time, there is a major problem in the area of matching tests to objectives. This can be accomplished by developing the tests locally to match the objectives selected. If this is done, great care must be taken to insure that the tests are of high quality. Locally developed tests have the disadvantage of not yielding comparisons of achievement of local students with other students. One way to get comparative data is to use released items from national assessment tests or state assessment tests and then compare performance on an item-by-item basis.

In this day of accountability, there is great pressure to raise test scores, and often the "bottom line" is student performance on whatever testing system is used. If commercially available standardized tests are used, scores can be increased by adjusting the objectives of the curriculum to match the objectives measured by the test. Unfortunately, the standardized tests

available today generally do not adequately cover the full range of basic skills recommended by the NCSM position. The process of developing test items, field testing them, assembling them into tests, and then norming the tests takes a period of years. Most of the currently available standardized tests were well into the development cycle before the NCSM position was published. The situtation is not likely to correct itself in the near future — most of the major publishers have just completed revisions, and the next revision won't take place for several years.

In Minneapolis we are currently reviewing available standardized tests, and the only one we have found that specifically used the NCSM position for its guideline is the basic skills test published by the Educational Testing Service. The availability of more tests which measure the full range of basic skills would be helpful. However, the pressure to increase performance on nationally published tests can become pressure for a national curriculum, contrary to our tradition of local control of education.

In Minneapolis we have decided to use a basic mathematical knowledge testing program to define the basic mathematical skills that high school students are expected to learn. This locally developed testing program is keyed to the ten NCSM basic skill areas. Each time the test is administered, a new form is developed so that previous forms may be used for communicating objectives and for practice. The test items on the Minneapolis Basic Mathematical Knowledge Test do not fall into ten distinct categories corresponding to the ten skill areas. Most of the questions that students should be able to answer are concerned with several of the basic skill areas. The list of ten skill areas is valuable for checking to see that our testing program covers the range of basic skills needed by students. However, an attempt to completely isolate the skills into these areas would be counterproductive. *Students must be able to interrelate the skills from all ten skill areas.*

Systematic Instruction in Basic Skills

Basic skills instruction should use a systematic approach in which the objectives are clearly communicated to the students, the teachers, the parents, and other interested persons. Learning materials and strategies should be organized to address specific objectives. At the same time, the program should have the flexibility to address objectives which have not been determined in advance. Test results, teacher observation, and other sources should be used to improve instruction. For example, teachers and students should have immediate feedback information in order to direct learning toward student needs. Item analysis information from testing should be used by faculty to focus curriculum and staff development efforts on curriculum areas where there are specific needs. The instructional program should include a systematic procedure for maintaining skills that have been learned earlier.

. . . the major focus of school mathematics should be on helping students acquire the ability to solve problems.

There is no single prescription for a best way to teach basic mathematical skills. However, there are some things that we do know from research and experience. For example, we know that the amount of time spent on a task is an important factor. We also know that manipulative materials can be used effectively in developing mathematical concepts. Learning is a very complex process, and an attempt to simplify it by treating the various skills in isolation from one another would be counterproductive. The basic mathematical skills are useful only when they are interrelated with one another and with skills from other disciplines. The mistaken notion that computation should be learned before other mathematical skills must be overcome. The interrelation of skills should begin in kindergarten and continue throughout education.

In keeping with the first of the NCTM recommendations for the 1980s, the major focus of school mathematics should be on helping students to acquire the ability to solve problems. To do this, they will need to be able to interrelate skills from all ten NCSM skill areas. They

will also need to develop proficiency with specific skills. For example, a student who wants to determine how long a particular trip will take may have to begin by using a map or a table to determine the distance. Then, after estimating the average rate of speed, the student will have to know how to divide the distance by the speed to arrive at the time. The student will also need to know enough about units of measure to realize that if the distance is measured in miles and the rate in miles per hour, then the resulting time after dividing will be the number of hours the trip will take. Finally, the student should check to see if the time is reasonable for the particular trip.

Students should learn a variety of problem-solving techniques, such as organizing information into tables, guessing, and checking. They should be presented with practical and interesting problem situations. To help them determine if answers are reasonable, they should develop approximation skills. For example, they should learn rounding and other approximation techniques in order to quickly estimate if a bill is correct.

In today's society, with ready access to calculators and computers, the role of computation is changing. The ability to do rapid mental calculation with one-digit numbers is a skill that is vital to problem solving and to estimation and approximation. Calculators are too cumbersome and slow for this type of activity. On the other hand, today complicated calculations such as division by three- or four-digit numbers are accomplished more accurately and rapidly by electronic means. Therefore, we should not require students to rapidly perform large numbers of long computation exercises.

Computation should be taught in a way that will enable students to apply it to problem situations they will face in everyday life. For example, a student who has only learned the "take away" concept of subtraction may not be able to apply subtraction to a situation where the question is one of how much more one quantity is than another.

With the emergence of electronic technology and the forthcoming conversion to the metric system, computation with decimals is becoming more important. Computation with fractions is still important, but students should not be required to do complicated fraction exercises involving large denominators. Because of the many uses of percent in society today, understanding of percent and ability to do computation involving percent are vital.

Students will need to acquire geometry and measurement skills so that they will be able to handle situations like fencing a yard or tiling a floor. They will need to be able to use tables, charts, and graphs to organize and present information or to gain information. They should learn how past experience is used to predict future events. For example, they can make estimates on the outcomes of athletic contests on the basis of past performances of teams or individuals. They should recognize that there are situations like the flipping of a coin where immediate past experience is not helpful in determining future outcomes.

Finally, students should become sufficiently informed about computer technology so that they will be wary of statements like "the computer made a mistake" or "you can let a computer do your thinking for you."

Professional Leadership

The National Advisory Committee on Mathematics Education states that teachers should select methods and materials which seem to work best at particular times for particular students (NACOME, 1975, p. 50). To accomplish this, teachers need training and support from professional mathematics education specialists.

School systems should look within their faculties for individuals with leadership potential and with particular interest and expertise in mathematics education . . . and should encourage them to participate in inservice activities . . . and to keep abreast of the rapid developments in evolving areas . . .

Professional mathematics education leadership within school systems is a key factor in the identification of basic skills and the develop-

ment and implementation of basic skills instructional programs designed to have students learn these skills. Curriculum development and staff development needs can best be met if there is professional leadership at both the school district level and the building level. School systems should look within their faculties for individuals with leadership potential and with particular interest and expertise in mathematics education. Leaders identified should be encouraged to participate in inservice activities offered by the school district, state and regional agencies, higher education, and mathematics education professional organizations. These leaders must keep abreast of the rapid developments in areas such as evolving basic skills programs and new applications of computers and calculators in mathematics education. The best way to remain current is through the meetings and publications of the National Council of Teachers of Mathematics and its many affiliated organizations. For example, in 1978 the Virginia Council of Teachers of Mathematics published a monograph entitled *Practical Ways to Teach the Basic Mathematical Skills*. Each of the publication's ten chapters addresses one of the ten NCSM basic skills areas. In April 1979 the Association of Teachers of Mathematics of New York City published *A Look at Standardized Mathematics Testing in New York City*, which reports on a survey of the extent to which the ten NCSM basic skills areas are evaluated by five widely used national standardized tests. Leaders at the district level can benefit greatly from participation in the National Council of Supervisors of Mathematics.

Support for Basic Skills Instruction

The decline in problem-solving ability, particularly among 17-year-olds, from 1973 to 1978, on National Assessment of Educational Progress tests is a matter of major concern (NAEP, p. 25). This decline comes at a time when the public is demanding competence in mathematics and when professionals are asserting the importance of problem solving as a basic mathematical skill. In the past, instruction in basic mathematical skills at the secondary level has not received the attention it deserves. At the national level, there have been virtually no programs dealing with basic mathematical skills at the secondary level. For example, there are no nationally validated programs for basic mathematical skills in grades nine through twelve (U.S. Department of Education, 1980). Demands for competence are being made at the state level, but the state competency testing in Florida (where about a third of the students failed the mathematics competency component of the state competency test) illustrated the inadequacy of secondary programs and the need for changes in instruction if testing is to help students. At the local level, many schools don't require any mathematics beyond ninth grade. The gap between what the students need and what the schools are providing must be closed.

Student achievement in basic mathematical skills can be improved if there is commitment and systematic planning. There should be an affirmation by the administration and agreement by the staff that the goal of helping students achieve competence in basic mathematical skills is a priority. This commitment, accompanied by a priority allocation of human and financial resources, will receive community support. The establishment of the Basic Skills Improvement Program is a response to this concern at the federal level. State-level response has been reflected in the establishment of competency programs in 36 states. Evidence for support at the local level can be found in the results of the 1979 Gallup Poll on Education, where 97 percent of the respondents indicated that mathematics should be a top priority.

We can do a better job of having our students learn the basic mathematical skills they will need as adults. We can do this through a forward-looking approach to basic skills backed by commitment, leadership, and high expectations for students and staff.

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NATIONAL COUNCIL OF SUPERVISORS OF MATHEMATICS POSITION PAPER ON BASIC MATHEMATICAL SKILLS

INTRODUCTION

The currently popular slogan "Back to the Basics" has become a rallying cry of many who perceive a need for certain changes in education. The result is a trend that has gained considerable momentum and has initiated demands for programs and evaluations which emphasize narrowly defined skills.

Mathematics educators find themselves under considerable pressure from boards of education, legislatures, and citizens' groups who are demanding instructional programs which will guarantee acquisition of computational skills. Leaders in mathematics education have expressed a need for clarifying what are the basic skills needed by students who hope to participate successfully in adult society.

The narrow definition of basic skills which equates mathematical competence with computational ability has evolved as a result of several forces:

1. Declining scores on standardized achievement tests and college entrance examinations;
2. Reactions to the results of the National Assessment of Educational Progress;
3. Rising costs of education and increasing demands for accountability;
4. Shifting emphasis in mathematics education from curriculum content to instructional methods and alternatives;
5. Increased awareness of the need to provide remedial and compensatory programs;
6. The widespread publicity given to each of the above by the media.

This widespread publicity, in particular, has generated a call for action from governmental agencies, educational organizations, and community groups. In responding to these calls, the National Institute of Education adopted the area of basic skills as a major priority. This resulted in a Conference on Basic Mathematical Skills and Learning, held in Euclid, Ohio, in October, 1975.

The National Council of Supervisors of Mathematics (NCSM), during the 1976 Annual Meeting in Atlanta, Georgia, met in a special session to discuss the Euclid Conference Report. More than 100 members participating in that session expressed the need for a unified position on basic mathematical skills which would enable them to provide more effective leadership within their respective school systems, to give adequate rationale and direction in their tasks of implementing basic mathematics programs, and to appropriately expand the definition of basic skills. Hence, by an overwhelming majority, they mandated the NCSM to establish a task force to formulate a position on basic mathematical skills. This statement is the result of that effort.

RATIONALE FOR THE EXPANDED DEFINITION

There are many reasons why basic skills must include more than computation. The present technological society requires daily use of such skills as estimating, problem solving, interpreting data, organizing data, measuring, predicting and applying mathematics to everyday situations. The changing needs of society, the explosion of the amount of quantitative data, and the availability of computers and calculators demand a redefining of the priorities for basic mathematics skills. In recognition of the inadequacy of computation alone, NCSM is going on record as providing both a general list of basic mathematical skills and a clarification of the need for such an expanded definition of basic skills.

Any list of basic skills must include computation. However, the role of computational skills in mathematics must be seen in the light of the contributions they make to one's ability to use mathematics in everyday living. In isolation, computational skills contribute little to one's ability to participate in mainstream society. Combined effectively with the other skill areas, they provide the learner with the basic mathematical ability needed by adults.

DEFINING BASIC SKILLS

The NCSM views basic mathematical skills as falling under ten vital areas. The ten skill areas are interrelated and many overlap with each other and with other disciplines. All are basic to pupils' development of the ability to reason effectively in varied situations.

This expanded list is presented with the conviction that mathematics education must not emphasize computational skills to the neglect of other critical areas of mathematics. The ten components of basic mathematical skills are listed below, but the order of their listing should not be interpreted as indicating either a priority of importance or a sequence for teaching and learning.

Furthermore, as society changes our ideas about which skills are basic also change. For example, today our students should learn to measure in both the customary and metric systems, but in the future the significance of the customary system will be mostly historical. There will also be increasing emphasis on when and how to use hand-held calculators and other electronic devices in mathematics.

TEN BASIC SKILL AREAS

Problem Solving

Learning to solve problems is the principal reason for studying mathematics. Problem solving is the process of applying previously acquired knowledge to new and unfamiliar situations. Solving word problems in texts is one form of problem solving, but students also should be faced with non-textbook problems. Problem-solving strategies involve posing questions, analyzing situations, translating results, illustrating results, drawing diagrams, and using trial and error. In solving problems, students need to be able to apply the rules of logic necessary to arrive at valid conclusions. They must be able to determine which facts are relevant. They should be unfearful of arriving at tentative conclusions and they must be willing to subject these conclusions to scrutiny.

Applying Mathematics to Everyday Situations

The use of mathematics is interrelated with all computation activities. Students should be encouraged to take everyday situations, translate them into mathematical expressions, solve the mathematics, and interpret the results in light of the initial situation.

Alertness to the Reasonableness of Results

Due to arithmetic errors or other mistakes, results of mathematical work are sometimes wrong. Students should learn to inspect all results and to check for reasonableness in terms of the original problem. With the increase in the use of calculating devices in society, this skill is essential.

Estimation and Approximation

Students should be able to carry out rapid approximate calculations by first rounding off numbers. They should acquire some simple techniques for estimating quantity, length, distance, weight, etc. It is also necessary to decide when a particular result is precise enough for the purpose at hand.

Appropriate Computational Skills

Students should gain facility with addition, subtraction, multiplication, and division with whole numbers and decimals. Today it must be recognized that long, complicated computations will usually be done with a calculator. Knowledge of single-digit number facts is essential and mental arithmetic is a valuable skill. Moreover, there are everyday situations which demand recognition of, and simple computation with, common fractions.

Because consumers continually deal with many situations that involve percentage, the ability to recognize and use percents should be developed and maintained.

Geometry

Students should learn the geometric concepts they will need to function effectively in the 3-dimensional world. They should have knowledge of concepts such as point, line, plane, parallel, and perpendicular. They should know basic properties of simple geometric figures, particularly those properties which relate to measurement and problem-solving skills. They also must be able to recognize similarities and differences among objects.

Measurement

As a minimum skill, students should be able to measure distance, weight, time, capacity, and temperature. Measurement of angles and calculations of simple areas and volumes are also essential. Students should be able to perform measurement in both metric and customary systems using the appropriate tools.

Reading, Interpreting, and Constructing Tables, Charts, and Graphs

Students should know how to read and draw conclusions from simple tables, maps, charts, and graphs. They should be able to condense numerical information into more manageable or meaningful terms by setting up simple tables, charts, and graphs.

Using Mathematics to Predict

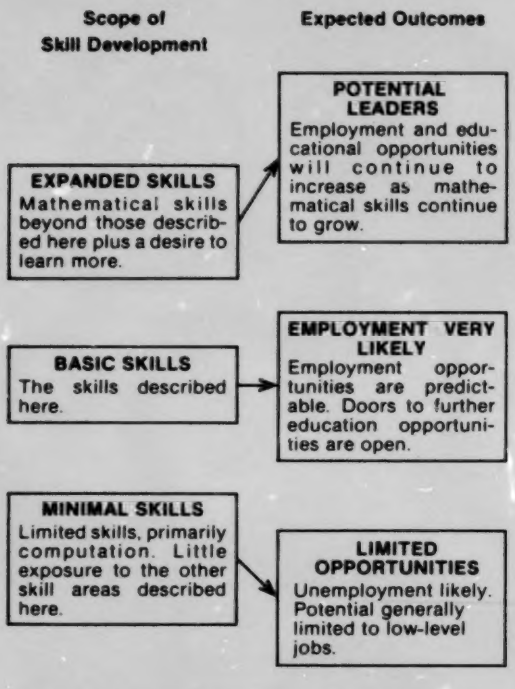
Students should learn how elementary notions of probability are used to determine the likelihood of future events. They should learn to identify situations where immediate past experience does not affect the likelihood of future events. They should become familiar with how mathematics is used to help make predictions such as election forecasts.

Computer Literacy

It is important for all citizens to understand what computers can and cannot do. Students should be aware of the many uses of computers in society, such as their use in teaching/learning, financial transactions, and information storage and retrieval. The "mystique" surrounding computers is disturbing and can put persons with no understanding of computers at a disadvantage. The increasing use of computers by government, industry, and business demands an awareness of computer uses and limitations.

BASIC SKILLS AND THE STUDENT'S FUTURE

Anyone adopting a definition of basic skills should consider the "door-opening/door-closing" implications of the list. The following diagram illustrates expected outcomes associated with various amounts of skill development.


Scope of Skill Development
Expected Outcomes
EXPANDED SKILLS
Mathematical skills beyond those described here plus a desire to learn more.
POTENTIAL LEADERS
Employment and educational opportunities will continue to increase as mathematical skills continue to grow.
BASIC SKILLS
The skills described here.
EMPLOYMENT VERY LIKELY
Employment opportunities are predictable. Doors to further education opportunities are open.
MINIMAL SKILLS
Limited skills, primarily computation. Little exposure to the other skill areas described here.
LIMITED OPPORTUNITIES
Unemployment likely. Potential generally limited to low-level jobs.

MINIMUM ESSENTIALS FOR HIGH-SCHOOL GRADUATION

Today some school boards and state legislatures are starting to mandate mastery of minimum essential skills in reading and mathematics as a requirement for high-school graduation. In the process, they should consider the potential pitfalls of doing this without an appropriate definition of "basic skills." If the mathematics requirements are set inordinately high, then a significant number of students may not be able to graduate. On the other hand, if the mathematics requirements are set too low and mathematical skills are too narrowly defined, the result could be a sterile mathematics program concentrating exclusively on learning of low-level mathematical skills. This position paper neither recommends nor condemns minimal competencies for high-school graduation. However, the ten components of basic skills stated here can serve as guidelines for state and local school systems that are considering the establishment of minimum essential graduation requirements.

DEVELOPING THE BASIC SKILLS

One individual difference among students is style or way of learning. In offering opportunities to learn the basic skills, options must be provided to meet these varying learning styles. The present "back-to-basics" movement may lead to an emphasis on drill and practice as a way to learn.

Certainly drill and practice is a viable option, but it is only one of many possible ways to bring about learning and to create interest and motivation in students. Learning centers, contracts, tutorial sessions, individual and small-group projects, games, simulations and community-based activities are some of the other options that can provide the opportunity to learn basic skills. Furthermore, to help students fully understand basic mathematical concepts, teachers should utilize the full range of activities and materials available, including objects the students can actually handle.

The learning of basic mathematical skills is a continuing process which extends through all of the years a student is in school. In particular, a tendency to emphasize computation while neglecting the other nine skill areas at the elementary level must be avoided.

EVALUATING AND REPORTING STUDENT PROGRESS

Any systematic attempt to develop basic skills must necessarily be concerned with evaluating and reporting pupil progress.

In evaluation, test results are used to judge the effectiveness of the instructional process and to make needed adjustments in the curriculum and instruction for the individual student. In general, both educators and the public have accepted and emphasized an overuse of and overconfidence in the results of standardized tests. Standardized tests yield comparisons between students and can provide a rank ordering of individuals, schools, or districts. However, standardized tests have several limitations including the following:

a. Items are not necessarily generated to measure a specific objective or instructional aim.
b. The tests measure only a sample of the content that makes up a program; certain outcomes are not measured at all.

Because they do not supply sufficient information about how much mathematics a student knows, standardized tests are not the best instruments available for reporting individual pupil growth. Other alternatives such as criterion tests or competency tests must be considered. In criterion tests, items are generated which measure the specific objectives of the program and which establish the student's level of mastery of these objectives. Competency tests are designed to determine if the individual has mastered the skills necessary for a certain purpose such as entry into the job market. There is also need for open-ended assessments such as observations, interviews, and manipulative tasks to assess skills which paper and pencil tests do not measure adequately.

Reports of pupil progress will surely be made. But, while standardized tests will probably continue to dominate the testing scene for several years, there is an urgent need to begin reporting pupil progress in other terms, such as criterion tests and competency

measures. This will also demand an immediate and extensive program of inservice education to instruct the general public on the meaning and interpretation of such data and to enable teachers to use testing as a vital part of the instructional process.

Large scale testing, whether involving all students or a random sample, can result in interpretations which have great influence on curriculum revisions and development. Test results can indicate, for example, that a particular mathematical topic is being taught at the wrong time in the student's development and that it might better be introduced later or earlier in the curriculum. Or, the results might indicate that students are confused about some topic as a result of inappropriate teaching procedures. In any case, test results should be carefully examined by educators with special skills in the area of curriculum development.

CONCLUSION

The present paper represents a preliminary attempt by the National Council of Supervisors of Mathematics to clarify and communicate its position on basic mathematical skills. The NCSM position establishes a framework within which decisions on program planning and implementation can be made. It also sets forth the underlying rationale for identifying and developing basic skills and for evaluating pupils' acquisition of these competencies. The NCSM position underscores the fundamental belief of the National Council of Supervisors of Mathematics that any effective program of basic mathematical skills must be directed not "back" but *forward* to the essential needs of adults in the present and future.

You are encouraged to make and distribute copies of this paper.

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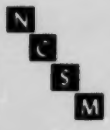

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A Child Is More than a Machine

Alan R. Hoffer
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Editors' Note: *The two preceding papers discuss research and professional support for expanding our view of mathematics beyond computation. The finding of the National Assessment of Educational Progress in recent years is that students do well on simple computation but poorly on problem solving. In this paper Alan Hoffer discusses the need to teach children to see and understand problem situations. Dr. Hoffer is involved in research on problem solving and on how to help people do problem solving. Although we have much more to learn about these complex tasks, he shares what is known about the role of insight in problem solving and suggests approaches that help students learn to use insight.*

Introduction

Children are born with the capacity to memorize, to understand, to see problems, and to solve problems. By the time they are ready to enter school, most children have an intuitive ability to solve simple problems in mathematics. If that ability is nurtured throughout their school years, they can become confident, competent users of problem-solving skills in all aspects of their lives. If, however, the emphasis in mathematics instruction is on memorizing, on computation, on drill, and on solving only very simple word problems, these students will be stifled in their growth; many may even develop a dislike of mathematics, and perhaps a fear of it, that will remain with them and influence the direction their lives take.

This paper discusses how students learn to put skills together so they can be used to solve day-to-day problems and how teachers and administrators can contribute to this process. The emphasis here is on *insight*, a special skill of seeing and understanding problems and their solutions. This skill, like any other, can be taught, but it requires creativity and risk taking on the part of the student. The teacher must not only provide appropriate learning experiences but must also be supportive and encouraging when the child is not successful. Both teacher and student need to view "mistakes" positively, as opportunities to learn.

Learning of insight requires that the student and teacher participate in experiences that are particularly human. The author is not suggesting that teaching mechanical skills is wrong, but that there is a danger that both student and teacher will get caught up with the mechanics and that time will not be spent on learning to see the applications — on putting the skills together so they work.

Definitions of Skills

Nine-year-old Tia wants to become a musician. When she proudly takes her flute to her first lesson, she discovers that she cannot make a sound. It takes the entire lesson to learn how to play a note every time she tries. As she learns to play the

flute, Tia must learn to press certain keys to make certain sounds, to blow in certain ways, and to read music. She will never become a flutist by separately practicing her fingering, then blowing, and then reading notes. In these early lessons she must go very slowly, learning individual skills and, at very nearly the same time, learning to integrate these skills. Tia is a long way from being a musician.

Philip wants to be a basketball player. He needs to learn how to shoot, to pass, to dribble, and to run plays. In addition to learning all of these skills, he has to improve his overall physical condition. Philip cannot spend an hour each on shooting baskets, passing, dribbling, and running plays to become a good player. He must learn to combine these skills in a smooth fashion.

What is a skill? Typical dictionary definitions use phrases like "a learned power of doing something competently." So a skill involves the ability to perform; a skill can be viewed in a narrow sense (the ability to hammer a nail into a piece of wood) or in a broad sense (the ability to build a house). In each human activity the separate skills and competencies must work together to form a phenomenon greater than any of the individual skills. The learner must weave together the separate skills to form higher level skills. Of course, people are not limited — robot fashion — to a single activity or focus. They are involved continually in numerous and varied activities — all of which involve skills of some sort.

In mathematics, as in every human endeavor, there are many stages in the learning process. In the early stages the learner must master skills upon which later stages will be built. The goal for educators, ideally, is to develop students' abilities to apply high-level problem-solving skills in day-to-day situations. Over the years, however, mathematics has been (un)popularized to form a very limited and shallow view of the subject. Indeed, today many people think that mathematics consists of little more than arithmetic, algebraic formulas, and geometric vocabulary.

If the narrow definition of "skill" is allowed to dominate mathematics education, students will, of course, develop an ability to perform, but they will become "skillful" in the same sense that modern calculators and computers are "skillful" — they will develop machine skills at the expense of human skills. Consider this example:

Teacher:	Dan, if an airplane can travel 1200 kilometers in 3 hours, how far can it fly in 5 hours at the same rate?
Dan:	I don't know.
Teacher:	How much is 1200 divided by 3?
Dan:	400.
Teacher:	How much is 5 times 400?
Dan:	2000.
Teacher:	If an airplane can fly 1200 kilometers in 3 hours, how far can it fly in 5 hours at the same rate?
Dan:	I don't know. Is it 2000?

Dan was able to perform the division ($1200 \div 3$) and multiplication (5×400) calculations, and yet he was unable to solve the problem. If we accept the fact that a machine skill is a task that a machine can do, then Dan possessed sufficient machine skills to solve the problem. However, he lacked the human skills needed to interpret the problem and to know which machine skills to use.

There is a danger that the basic skills are being interpreted by schools and communities as machine skills. When these limitations are imposed on children, the results are devastating. The children may be able to perform machine skills, but they are unable to apply the skills to the problems they encounter in school and in daily life.

So, whatever definitions we use for basic skills, we must include basic abilities to use and apply lower-level skills at higher levels and in problem-solving situations. Several excellent lists of the important mathematical skills have been developed and are discussed in the paper by Ross Taylor in this handbook. Of particular importance is the position paper developed by the National Council of Supervisors of Mathematics.

Mechanistic Mathematics Skills and Teaching

Heidi is now an experienced driver. When she gets into the car, she locks the door, fastens her

seatbelt, starts the engine, releases the emergency brake, puts the car in gear, and looks in the rear-view mirror before she takes her foot off the brake and begins to back out of the driveway. At the same time she is going over in her mind the article she read in the paper last night about how to improve her tennis game.

The human mind has an amazing capacity to block from consciousness vast numbers of actions that we perform daily. In using mathematical skills, children must arrive at the point where many of the steps they go through to solve a problem are subconscious. This is necessary so that their thoughts will not be cluttered with admittedly important, yet highly distracting, actions.

There is certainly a need for reflex behavior. It is likely that, for the sake of efficient thought, children in the fourth grade should automatically know that 7×8 is equal to 56. But the attainment of such behavior should not dominate the teaching of mathematics, whether children are learning arithmetic facts in grade four or algebraic manipulations in grade eight or nine. If they don't know the facts, students should be encouraged to use their calculators. Eventually, they may internalize the facts, and the calculator just might help them do that.

It could be the case that too much mechanical practice, especially without careful supervision and evaluation, is counterproductive. Consider the following examples, taken from Ashlock (1972), of children practicing some arithmetic skills.

Harold's class is learning how to add decimals. On the practice exercises Harold worked like this:

A.	B.	C.	D.
.8	.6	.4	.5
+.4	+.9	+.3	+.8
.12	.15	.7	.13

Find Harold's errors. What "skill" was he applying?

Lately Barbara has been making errors in her subtraction practice. Here is her work. What "skill" was she applying?

A.	B.	C.	D.
8	2	5	2
693	325	726	434
−248	−151	−349	−276
445	174	287	68

In adding decimals Harold learned how to "line up" the decimal points and then add. He mechanically brought the decimal point down to the answer. That "skill" worked for exercise C but not for the other exercises. Barbara, on the other hand, is probably not ready to practice borrowing with three-digit numbers. Exercises C and D indicate that she "loans" a hundred to the units or ones column. She probably needs more work with place value, even at the concrete level, before she continues to practice on such problems as these.

We see error patterns occur in several subjects. Algebra teachers, for example, report that students consistently misapply distributive thinking to associative instances. In such cases, $5(xy)$ might become $(5x)(5y)$ or even $5x + 5y$. Misapplied rules also cause students to change $\frac{6x + 2}{2}$ into $6x$ or $3x$.

There is indeed a place for practice in mathematics instruction. But the practice should be meaningful, not mechanical. The learning environment should not allow error patterns to develop and continue.

Using Skills Requires Insight

We have assumed that a skill is an ability to do something competently. Competence must go beyond simply being able to perform a skill, however. Students must develop the ability to assess a situation to determine which skills are necessary in the situation and to apply those skills in an efficient, competent manner. When they develop this ability, they will have insight. Three qualities work together in the person who has insight:

1. The ability to perform in a possibly unfamiliar situation;
2. The ability to perform competently (correctly and adequately) the acts required by the situation; and
3. The ability to perform intentionally (deliberately and consciously) a method that resolves the situation.

Van Hiele (1973) and van Dormolen (1976) have each described insight in this manner.

The three qualities are interdependent — to

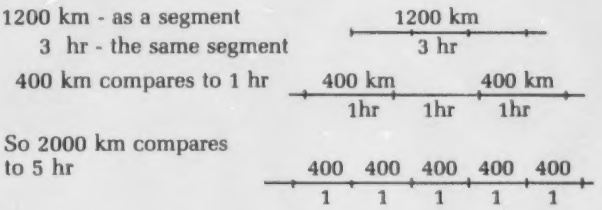
have insight a student must have all three qualities. Harold and Barbara intentionally applied their methods to the arithmetic practice, but they performed incorrectly. Dan was able to correctly perform the arithmetic calculations in the airplane question, but he did not understand why those operations were used. Compare Dan's responses with Erin's in the following problem:

Teacher: Suppose Mark's diesel car can travel 100 kilometers (km) on 5 liters (l) of fuel. If his tank holds 38 liters, how far could he travel on a full tank?
Erin: Oh, I know, 760 kilometers.
Teacher: How did you get that answer?
Erin: He traveled 100 km on 5 liters, so he uses 1 liter for each 20 km. I divided 100 by 5. So for 38 liters, Mark could travel 760 km because 20 times 38 is (equal to) 760.

The teacher was very pleased with Erin's responses. She had not seen the problem before. It was a new situation for her and she was able to interpret the question. Not only was she able to apply the rote skills competently, but she demonstrated in her explanation that she had a full understanding of the problem. She knew what she was doing and why. It is likely that she could solve any problem similar to the one stated. Erin has insight.

To say that a person has skills in mathematics requires that she or he have insight. This means that the person will be able to exhibit the human factor in skill performance. Insight distinguishes humans from machines.

To say that a person has skills in mathematics requires that she or he have insight. This means that the person will be able to exhibit the human factor in skill performance. Insight distinguishes humans from machines. A mathematics program which concentrates on machine skills and neglects to develop insight cheats the consumers (the children). It truncates their intellectual growth. Dan, for example, could have used insight in the airplane problem if he had been taught the basic skill of using a mathematical model — a representation of a phenomenon that uses mathematical concepts. For example, the 1200-kilometer distance and the three-hour time could have been modeled (represented) by a segment. The problem could be solved visually as follows:



Ways to Develop Insight and Understanding

In order to learn skills, to integrate them, and to be able to apply them to daily problems and in unfamilar situations, it is essential that children develop confidence in themselves, in the school environment, in mathematics, and in their ability to apply, or use, mathematics. Teachers can help students develop positive self-concepts by respecting their students and making them feel respected; by establishing a receptive attitude in the classroom so students are willing to express themselves and to learn; by providing fair challenges; by maximizing freedom from threat; and by providing success experiences. It is only in such an atmosphere that students will learn to be creative problem solvers and will feel comfortable taking risks. (See Mathematics Resource Project, 1978.)

A critical part of this positive classroom atmosphere is the view — by both teacher and students — that making mistakes is an important part of the growth experience in mathematics education. Red marks indicating errors on students' tests and homework papers are given more in mathematics than in any other subject area. They do not belong in any child's life. They can lead to self-doubt, to loss of interest in mathematics, and to loss of confidence in the teacher (Tobias, 1978).

Some superb teachers have the skill of providing their students with a loom (see Anderson and Greenwood, 1976). The loom helps students weave together the skills they possess to

produce skills at a higher level. These teachers help students acquire understanding. They believe that their students should become aware of a variety of problem situations and should understand why they study certain topics. They develop acquisition activities which give students opportunities to practice and extend past learnings. They provide these through laboratory investigations and through explorations that arise from daily problems.

There is an interesting analogy between teaching and coaching. Coach Brooks worked very hard to "learn" football. He knows various defense formations and offense plans. He understands his players well and knows their strengths and weaknesses. He organizes training programs for them that include calisthenics and weight lifting. The players practice blocking, tackling, and catching passes. They run plays and scrimmage. The players are *aware* of what they need to practice; through practice they *acquire* the skills needed to perform well; and they *internalize* these skills so that during a game they can adjust to new situations. They are using insight.

Helping students develop insight into mathematics requires a good deal of work. The children must be presented with opportunities and activities that are structured by the teacher. The development of such activities might follow this sequence:

1. *Inquiry.* In class discussion the teacher presents a problem or describes a certain situation, for example, something related to cubes. The children make or are given models of cubes which they examine and talk about. They are encouraged to make observations and to begin using the vocabulary related to cubes.
2. *Directed orientation.* The teacher asks the students specific questions or assigns them very definite tasks. The tasks are such that there are definite answers which the students all agree on eventually.
3. *Explanation.* Now the students, with the teacher's help, describe the various relationships that they observed. This acts as a summary of earlier observations for the students and helps to make the ideas explicit in the students' minds.
4. *Free orientation.* The students are now familiar with the vocabulary and elementary ideas of the topic, and they are asked to explore and look for more relationships on their own.
5. *Integration.* Finally, the students have a comfortable understanding of the topic. They see how the ideas are related and, if presented with a problem that is related to cubes, they could find their own way to a solution. The students have developed insight into the topic.

The inquiry and directed orientation phases form an awareness of the topic for the students; acquisition of the ideas is developed during the explanation and free orientation phases; internalization occurs in the integration phase.

Other Essential Ingredients for Success

Teacher: What number makes this sentence true? $6 \times \square = 3$?
Mike: Three sixths.
Teacher: No. (Mike was surprised. He thought he was right.)
Cathy: One half.
Teacher: Correct. Very good.
Mike (insisting): But if you put 3/6 in the box, $6 \times 3/6 = 3$. So 3/6 makes it true.
Teacher: Class, why is 3/6 not the correct answer?
Cathy: Because 3/6 is not reduced.
Teacher: Yes. Now let's do the next problem.
Mike (interrupting): But didn't you tell us that 3/6 is equal to 1/2? So why isn't 3/6 the answer?
Teacher: You are just being stubborn. The answer is 1/2. Class, open your books to page 165 and work exercises 1 to 30.

It is possible that the teacher wanted to end the lesson and get the children to work, but it is also possible that she did not have enough understanding of mathematics to deal with Mike in a positive way. (Mike, by the way, was discouraged by this. He said nothing for the rest of the lesson.)

Certainly, teachers should not be the weak link in the educational process. Universities and colleges of education have the primary responsibility for educating prospective teachers and for ensuring that the teachers are knowledgeable in the subject in which they are certi-

fied to teach. Universities have not lived up to this responsibility, nor have state legislatures and certification boards who set minimum requirements been strict enough either in setting standards or in enforcing them. Also, principals, personnel directors, and local school boards have not insisted that incoming teachers have a strong preparation in mathematics. How can skills and insight be taught by people who lack these abilities themselves?

Lately there has been an increasing number of proposals to test teachers. Some states are discussing laws to implement such testing programs. In the National Institute of Education Conference on Basic Mathematical Skills and Learning (NIE, 1975) several papers alluded to the weak preparation and performance of teachers.

School administrators should hire not just adequate teachers, but great teachers! High school principals should insure that their mathematics teachers have not just minimum certification (there are numerous violations of even these lower bounds) but that the teachers have a contagious enthusiasm for mathematics that is conveyed to their students. Every elementary school should have at least one teacher who is a mathematics specialist, a person who possesses knowledge of and an enthusiasm for mathematics, a person who can help other teachers in the building on their mathematics lessons and who can assist with students who are having difficulties in learning mathematics when the need arises.

Once the team is in place, the members may need additional help, even encouragement. They may need materials to conduct laboratory explorations or time off to attend professional meetings, participate in inservice activities, learn new diagnostic techniques, or develop a new unit for next year's program.

Summary

Children are cheated when the mathematics program that they experience has an emphasis on rote skills. In such a program, there can be little assurance that students who master these low-level skills will be able to transfer them to day-to-day situations in which they must solve problems.

Devoting an excessive amount of school time to learning computational skills is also wasteful, since calculators can perform the skills, but, more importantly, precious time is taken away from developing insight in students and helping them learn how to use insight to apply skills to problem-solving situations.

Teachers should more actively help students develop insight to increase the students' level of skill performance. To do this, teachers must have a deep knowledge of and enthusiasm for mathematics and its applications. They must possess the skills and insight themselves.

By their support and encouragement, school administrators should more actively help teachers develop a functional mathematics program, one in which the students have confidence, grow intellectually, and experience success.

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Reading

Overview: *The first two papers in this section provide descriptions of the two major approaches to beginning reading instruction. Ken and Yetta Goodman describe their meaning-focused program, and Doug Carnine argues for reading instruction which emphasizes the development of decoding skills through use of a subskills approach. In his paper Harry Singer suggests one way the two approaches can be brought together, and in the fourth paper Rob Tierney and David Pearson review recent research on comprehension and suggest directions for improving instruction in comprehension. Lauren Resnick draws on thirty studies on the implications of research for reading instruction, as she reviews the history of the controversy between meaning-emphasis and decoding-emphasis proponents. Like Singer, she suggests ways that the different approaches can be effectively linked. In the last paper in this section, Penelope Peterson reports on an analysis of research outcomes of different approaches to basic skills instruction.*

Theories and Prescriptions for Early Reading Instruction*

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Editors' Note: *This paper was prepared as part of a synthesis project funded by NIE several years ago. That project involved the preparation and discussion of approximately thirty papers by outstanding researchers, each exploring implications of their work for practice and for further research. Lauren Resnick has drawn on those papers and on her own experience in schools in preparing this chapter, which was originally published as a summary of the implications of that collection of papers for practitioners. The author describes the two major orientations to reading instruction, reviews research on their effects, and suggests ways that elements of both approaches might be integrated without losing the strengths of either.*

Are some ways of teaching beginning reading more effective than others, especially for children in compensatory educational programs? What does the research say? Do the research findings agree with what experts in the field say about the theory of reading? These are the questions addressed in these volumes. The aim of the volumes is to clarify points of agreement and disagreement as a basis for advising educators and the public on the approaches to instruction most likely to be effective for hard-to-teach children. I attempt in this chapter to summarize the major points of view expressed here and to relate these positions to outcomes of evaluation studies comparing various reading approaches. On the basis of these twin sources of evidence, I draw implications for current practice in compensatory education and for new approaches to instruction that need systematic development and trial.

There is little doubt that those closely involved in questions of reading instruction — either as researchers or practitioners — believe that what is taught, and how it is taught, matters. The intensity of discussion, over the course of decades, is enough to convince us of this. But are these advocates of one or another approach right? Is there any basis at all for deciding among programs? Or is it the case, as some people continue to claim, that it doesn't matter how reading is taught as long as there is commitment to learning on the part of the teacher and the school; or that different children learn in such different ways that there is simply no way of choosing among competing programs on a general basis?

*Reprinted with the permission of the author and publishers from *Theory and Practice of Early Reading*, Vol. 2, edited by Lauren B. Resnick and Phyllis A. Weaver, 1979: Hillsdale, NJ, Lawrence Erlbaum Associates, Publishers.

To respond to these questions, I begin by characterizing what I perceive as the two main strands of theory concerning the nature of reading and learning to read. I then consider such empirical evidence as is available on the relative effects of programs that appear to embody these two views of reading. On the basis of this evidence, I (a) recommend an aspect of current practice in early reading, and (b) suggest new kinds of program development that hold promise for improving other important aspects of reading instruction.

Competing Positions on the Nature of Reading

Two main strands of theory concerning the nature of reading can be identified, both in the various chapters of these volumes and in a perusal of as much as a century of research literature on teaching reading. For the sake of simplicity, I call these the *reading as translation* and the *reading as language* positions.

Reading as Translation

One view considers reading to be essentially a process of translating printed symbols into some approximation of oral language and then letting already developed oral language abilities take over. In this view, reading is largely "parasitic" on speech. The most important thing that must be done in learning to read is to learn what the printed symbols "say" (i.e., what sounds they correspond to). No other activity is unique to reading; everything else is shared with speech. In addition, because the ability to comprehend speech is already present in any individual who is learning to read, only word recognition needs to be taught directly. Once words can be recognized, practice in this new (visual) mode of receiving language symbols will produce the fluency and response to meaning that characterizes skilled readers.

The reading as translation view generally leads to a predominant, or even exclusive, preoccupation with mastery of the alphabetic code. It suggests that whatever else is done early in instruction, the code must be taught. From this derives the notion that instructional materials should be organized so as to highlight predictable aspects of the print-sound code. In research, the translation position is associated with a concern for word recognition processes, with the role of the alphabetic code in recognition, and with the role of fast or "automatic" word recognition in facilitating reading comprehension. (See, for example, Perfetti & Lesgold, Vol. I, this series.) People who characterize reading in terms of print-sound translation freely admit that many people learn to read — that is, master the code so that they can use it automatically — without much direct instruction. But they often express special concern for the "hard-to-teach," including children in compensatory programs. They assume that the difficulty these individuals have in becoming competent readers is primarily a difficulty in mastering the code. They look for — and demonstrate — difficulties in skills they consider prerequisites to learning the alphabetic code, such as segmenting the speech stream (Liberman & Shankweiler, Vol. 2; Rozin & Gleitman, 1976). They tend to advocate prereading activities that teach these prerequisites or methods of reading instruction that teach them in the course of teaching the code (see also chapters by Rosner, Vol. 2; and Wallach & Wallach, Vol. 3).

Reading as Language

The second strand of theory holds that reading is a separate, autonomous language process. Understanding the written word is in certain important ways different from understanding spoken language. Written language is organized differently from spoken language. It also fulfills different social functions. Although written material *can* be read aloud, it is not primarily intended for this use. Furthermore, there are important differences in the ways in which speech and print are mentally processed. Because it is an autonomous language process, reading cannot be taught as if it were parasitic on speech. That is, we cannot assume that because people know how to translate print into sound (recognize words), they will be able to understand and use written language in functional ways. Instead, reading instruction must focus quite directly on the functional use of written language, preferably from the onset of instruction.

The instructional views of people who interpret reading as an autonomous language system are varied. None deny, for example, that the

alphabetic code must be learned, but they vary widely in their view of the amount and timing of direct instruction that should be devoted to it. All agree that reading instruction, essentially from the outset, must focus on deriving meaning from written language and on functional use of the written word. For this, they are prepared to sacrifice, if necessary, some rigor and speed in acquiring knowledge of the code. In general, people with this view of the nature of reading do not believe that learning the code is very difficult or that not knowing it is the major cause of reading failure. But a problem in characterizing this group of reading theorists is that they agree more on what learning to read is not — that is, it is not simply mastering the code — than on what it is.

A variety of approaches to reading instruction have been advocated by people who view reading as an autonomous language process. Probably the oldest and still most widely used is the "look–say" approach to word recognition, generally embodied in basal reading instructional programs prior to the late 1960s. "Look–say" or "whole-word" teaching methods arose in the first half of this century as a reaction against the dry, dull, and not very successful methods of reading that had predominated earlier and that focused on oral reading and on learning the alphabetic code. (See Resnick & Resnick, 1977, for a characterization of these earlier methods and of the success rates associated with them.) The essence of the philosophy underlying basal reading approaches was that reading should, from the outset, focus on extracting meaning rather than on "mechanics," the latter to be acquired later and with as little instruction as possible.

This basic view is shared by proponents of various "language-experience" approaches to reading instruction, although these people (e.g., Goodman & Goodman, Vol. 1) believe that for reading to become a functional communication system, it is necessary for it to be rooted in the communication needs and processes of the learner. For this reason, the basic "material" of reading ought to be text actually produced by the learners or their peers. Special variants of language-experience approaches have been proposed by those immersed in work with people from illiterate communities and from cultural backgrounds sharply divergent from dominant Western ones — for example, Ashton-Warner (1963) working with Maori children in New Zealand, and Freire (1970) working with illiterate adults in Brazil. In each of these cases, a key observation was that to make the effort to become literate, people of any age needed to recognize that their own concerns — not only those of an outside, and perhaps oppressive, culture — could be expressed in writing.

A similar argument is made by those who propose variants of language experience for compensatory education populations in America today. People who are concerned with these groups and who espouse the autonomous language system view of reading argue that failure to learn to read stems primarily from learners' not recognizing the relevance of school-related reading to intrinsically important events outside of school. The problem is a failure to recognize reading and writing as functional tools within their own culture, not an inability to perform the component skills such as decoding. Two prescriptions for instruction follow: for beginners, immediate and continuing focus on meaning through the medium of written materials produced (directly or through dictation) by the learners; and for those in need of remedial help, a focus on the reading and discussion of intrinsically interesting material rather than on "skill building." With respect to basic research, the autonomous communication system definition of reading leads to a concern with the ways in which meaningful written language is processed. Sentences are the smallest units of concern, and recently longer texts have been studied. The study of discourse processing is a relatively new area of study for psychology, and particularly for the psychology of reading, and therefore is developed much less thoroughly than is word recognition research. (See Just & Carpenter, 1977, for a collection of current work in this field.)

The Empirical Evidence Concerning Reading Instruction

Evidence clearly favoring one reading instructional approach over another in school settings is difficult to find. Most studies fail to

show significant differences, and those that do show differences are often attacked on one or another fine point of research methodology. Nevertheless, a consistent pattern of findings can be detected concerning both program effects and general style of instruction. This pattern can be summarized briefly in the following way. Concerning programs, when skill in word recognition is the primary dependent variable, code-oriented programs tend to be advantageous over language-oriented programs. This is especially true for children from low-socioeconomic-status (SES) groups and for low achievers in general. However, when comprehension beyond the very simplest levels is the criterion, there is no clear advantage for either code- or language-oriented programs. Concerning instructional style, direct instruction and well-structured curricula used under direct teacher control have a clear advantage, again especially for low-achieving or low-SES groups. I draw these conclusions on the basis of the evidence discussed in the following paragraphs.

Evidence clearly favoring one reading instructional approach over another in school settings is difficult to find.

Follow Through. Follow Through is a national experiment in primary education that has allowed comparisons of several different instructional approaches for poor children of varying cultural backgrounds. We now have data from several cohorts of Follow Through students (Stebbins, St. Pierre, Proper, Anderson, & Cerva, 1977). In none of the evaluations are the different instructional programs compared with each other in a strict experimental design. Instead, each program is compared with its own control group, which received the "standard" program of the school district. This means that the program to which the control group is exposed is not strictly specified. Nevertheless, patterns can be detected in which groups instructed with certain programs, used in a number of different school districts and over a number of years, often show reading achievement test scores superior to their control groups, and groups exposed to other programs rarely show such an advantage. These patterns suggest that the most structured Follow Through model — the University of Oregon's, which uses *Distar*, a program developed explicitly for Follow Through and other compensatory use — more regularly shows advantages over its control group than do the less structured models.[1] This pattern is strongest in first and second grades; it is present but weaker in third grade. By fourth grade, the advantage has disappeared. This summary is based primarily on data from the reading subtest of the Metropolitan Achievement Tests. From fourth grade on, this test stresses comprehension tasks. Data collected by the Oregon model sponsors on their own school suggest that when a test is used that stresses word recognition (such as the WRAT, the Wide Range Achievement Test), the advantage of the program is maintained even into the upper elementary grades.

To interpret this pattern, it is necessary to know that the Oregon and other structured Follow Through models use direct instruction approaches to reading and that their programs are code oriented rather than language oriented. Furthermore, these programs tend to include careful and individualized record keeping and a focus on a mastery of identifiable and measurable "components" of reading competence. The child-centered or less structured Follow Through models tend to use language-oriented instructional strategies. There is considerable variety with respect to specific programs and instructional styles, but there is — in keeping with the child-centered philosophy that governs most of these programs — substantial emphasis on embedding reading in naturally occurring language settings and relatively little emphasis on structured, direct instruction. The range of activities that might be considered "reading" or "reading related" in these programs is very wide; by contrast, only formal

[1] *Distar* stresses systematic code learning. Instruction in the program is teacher led, and children are taught in small groups. Activities for both the teachers and the students are prescribed in detail by the program.

reading and writing activities would be so considered in the structured programs. Thus, children in structured programs probably spend more time actually engaged in activities involving written materials.

Why is the advantage for the structured programs strongest at the lowest grade levels? It could be because the programs have been in use longer at those levels, and therefore both the materials and their implementation are more refined. However, the difference might also reflect a gradual shift in characteristics of the reading tests over grade levels. Although texts must be read and questions answered at all levels, the complexity of the texts and the inferential demands of the questions become progressively greater in higher grades. Children who were very good (for their age and grade) at word recognition could excel on the lower-grade tests because the linguistic complexity is low. At higher grades, more sophisticated language competence is required to do well, although the ability to recognize words is still needed. Therefore, the drop-off in advantage for the structured Follow Through models at higher grade levels probably reflects the structured programs' relative strengths. They are especially good at teaching word recognition but not especially good at teaching comprehension. The continued high performance of Oregon's children on the WRAT lends strength to this interpretation. Notice, however, that the structured, code-oriented programs are not *worse* at teaching comprehension than are the child-centered, language-oriented models; they are just not any better.

Chall's "Great Debate" Book. The Follow Through findings, based on national samples and a common set of measurements for various programs, mirror an older finding based on a review of research literature on reading instruction conducted up to about 1965. Jeanne Chall's book, *Learning to Read: The Great Debate*, published in 1967, reviewed a very large collection of studies comparing code, basal, and language-experience models. She concluded the following:

> Early stress on code learning, these studies indicate, not only produces better word recognition and spelling, but also makes it easier for the child eventually to read with understanding — at least up to the beginning of the fourth grade, after which point there is practically no evidence. ... The experimental research provides no evidence that either a code or a meaning emphasis fosters greater love of reading or is more interesting to children. ... There is some experimental evidence that children of below-average and average intelligence and children of lower socioeconomic background do better with an early code emphasis. Brighter children and those from middle and high socioeconomic backgrounds also gain from such an approach, but probably not as much. Intelligence, help at home, and greater facility with language probably allow these children to discover much of the code on their own, even if they follow a meaning program in school. [pp. 83-84]

Chall concluded that code emphases foster reading with understanding, but her evidence is virtually only for the primary grades. We do not know, on the basis of the older literature, whether the early gain with code-oriented programs is maintained later. Chall herself speculated that whether the advantage would be maintained would depend on whether reading in the higher grades contained enough stress on language and vocabulary growth and provided sufficiently challenging materials for reading. She apparently believed, although she did not directly state it at that time, that reading programs needed to shift from a code to a language emphasis after a certain level of code competence had been reached.

Guthrie's Study of Reading Problems. Guthrie and his colleagues (Guthrie, Samuels, Martuza, Seifert, Tyler, & Edwall, 1976) reviewed research on the nature and locus of reading programs. They report comparisons of good and poor readers, as measured by a standardized reading comprehension test, that show: (a) no difference in the grammatical or semantic acceptability of words substituted in the course of "misreading" a text; but (b) a greater tendency on the part of good readers to make errors based on graphic similarity. These findings are contrary to what proponents of language approaches to reading often predict — namely, that emphasis on learning the code will produce a tendency to attend *too much* to the spelling and *not enough* to the meaning of words and therefore will interfere with comprehension. Guthrie et al.'s summary also shows that poor readers in the intermediate

grades tend to be about as deficient in word knowledge as they are in comprehension, again contrary to what language proponents predict. Poor comprehenders are both poor decoders (i.e., they make more errors) and slow decoders (even when they do decode accurately). They are also weaker in using semantic and syntactic cues of language (e.g., they are less bothered by syntactic variations) both when reading and when listening. The general pattern seems to be one in which good decoding skills are quite clearly associated with good comprehension and in which syntactic and semantic difficulties are associated with oral as well as written language. This evidence, although correlational, seems to support those who view reading as translation to speech and to suggest that code-oriented early instruction is likely to be the most successful in overcoming difficulties in learning to read.

Guthrie's group also reanalyzed data from two major earlier investigations to determine whether instructional practices make a difference along the lines that I have suggested in this chapter. The first reanalysis was of the Bond and Dykstra (1967) first-grade studies. Using a word-reading subtest as a measure of knowledge of the code, this reanalysis showed a skills-oriented method (either linguistics or phonics) to be superior to a language-oriented method. The addition of a phonics program to a basal reading program also increased the basal's apparent effectiveness. On a paragraph-meaning test, no clear difference between skill-based and language-based approaches could be detected. The authors concluded that comprehension is not a problem in first grade and that it is therefore not surprising that instruction oriented primarily toward language comprehension has no strong effect. On the other hand, direct instruction in the code does seem to have positive effects on the aspect of reading that requires instruction at this stage.

The second reanalysis was done on the Educational Testing Service study of compensatory reading programs. The programs were classified as either high or low in instructional time and high or low in skill (code) emphasis. In addition, sex and three levels of SES were distinguished. Analyses of covariance (controlling for differences in autumn achievement test scores) on various dependent variables were then calculated. Clear patterns with respect to instructional emphasis are difficult to detect; however, more instructional time, especially for low-SES and compensatory instructional groups at both second- and sixth-grade levels, was found to be a clear benefit.

The California Teacher Study. The import of time and its relation to type of instructional program can be understood best by considering the work of Berliner and others on the California Teacher Study (Berliner & Rosenshine, 1977; Fisher, Filby, & Marliave, 1977; Rosenshine, 1976). According to these studies and literature reviews associated with them, increased time and direct teaching produce the strongest learning results. Most observable "direct teaching" tends to be focused on code aspects of reading. This may be partly because observers can easily agree on when "reading instruction" is taking place in the case of word recognition but are less certain of what constitutes "instruction" in comprehension. Whether a result of observational methodology or a real effect, this finding confirms a frequently noted correlation between a code orientation in reading and direct instructional strategies. The correlation is evident too in some chapters in these volumes (e.g., Bateman, Vol. 1; or Wallach & Wallach, Vol. 3; as against Goodman & Goodman, Vol. 1), although there are some exceptions (e.g., Chomsky, Vol. 2, on a child-centered approach to early appreciation of the code). The correlation raises some questions for us: Is the apparent effectiveness of code approaches to teaching due to their direct instruction characteristics or to the content of what is taught? If the former, might a language-oriented program using direct instruction be equally or more effective? I return to these questions as I address the question of what new instructional approaches warrant development and trial in the schools.

A Recommendation for Current Practice

I have distinguished, on the basis of these volumes and related literature, between two broadly defined approaches to reading instruction: a code orientation and a language orientation. The review of field research in reading has

suggested an advantage for code-oriented teaching roughly through the primary school years, the period during which tests demand relatively unsophisticated language processing and give a clear edge to those who can recognize printed words accurately and quickly. This advantage is especially marked for children in compensatory programs. After the primary grades, there is no clear evidence supporting either code or language approaches to instruction. What does this suggest for formulating policy regarding reading in compensatory education programs?

As a matter of routine practice, we need to include systematic, code-oriented instruction in the primary grades, no matter what else is also done. This is the only place in which we have any clear evidence for any particular practice. We cannot afford to ignore that evidence or the several instructional programs already in existence that do a good job of teaching the code. The charge — made by some who espouse language-oriented approaches and who view reading as an autonomous communication system — that too early or too much emphasis on the code depresses comprehension finds no support in the empirical data. On the other hand, neither is there support for a radical claim that once the code is well learned, other reading problems will disappear. Thus, there is no evidence that code-emphasis programs alone will "solve" the reading problem.

What appears to be needed is systematic code teaching together with attention to language-processing (i.e., comprehension) aspects of reading. But to say this is hardly to have completed a prescription for compensatory reading instruction. Virtually every reading program today claims to be providing just such a combination — yet we lack many smashing successes. Where does the difficulty lie?

It lies in part in a fundamental competition between code and language demands in early reading. Learning the code requires a controlled vocabulary — but language processing requires a rich language with which to work. This conflict cannot be wished away. Beck and Block (Vol. 1), in their comparative program analysis, pointed out how an "add-on" phonics program might lose its power when the spelling patterns taught are not given extensive practice in the reading materials that immediately follow. And no one has yet demonstrated empirically, with a compensatory education population, a successful way of teaching the code entirely on the basis of student-generated stories or words drawn from the students' natural environments. The strongest claims for success along these lines come from certain proponents of "alternative education." Despite the absence of formal evidence, I have seen enough of these programs to believe that many students who would resist reading in conventional programs become good readers in them. But in most cases, there is some largely "unsung" systematic code teaching, at least for a while, for most students. (For a systematic "alternative teaching" approach, complete with a diagnostic procedure and rather clear instructional plans, see Kohl's [1973] *Reading, How To.*)

The problem facing those who would design reading instruction for compensatory education, then, lies in great part in finding a balance of emphasis and timing between code and language aspects of reading.

The problem facing those who would design reading instruction for compensatory education, then, lies in great part in finding a balance of emphasis and timing between code and language aspects of reading. At the same time, substantial attention to *how* to address the language-processing aspect of reading is needed. We have a number of good code-oriented programs available, but we have no strong success to report for a language-oriented program. This does not argue for teaching the code and letting language take care of itself. It argues, instead, for using what we have in the way of successful code-teaching approaches and meanwhile focusing intensively on developing language-teaching approaches that are as effective in their own domain. In the next section, I consider some of the possibilities for language

instruction and for combining code and language training.

Toward Solving the Rest of the Reading Problem: New Approaches that Should be Tried

In this section I consider two issues: (a) how to teach language aspects of reading, and (b) how to combine language and code teaching.

Teaching Language Processes

Oral Versus Written. A first question in considering how to teach language-processing skills is whether it will be most effective to teach them in an oral mode or in a written mode. A not infrequently made proposal — by those who favor a strong code orientation for early reading — is to focus beginning reading instruction largely or exclusively on the code while providing separate instruction in oral language comprehension. This approach assumes that those who do not comprehend what they read, even though they know the code, are deficient in general language-processing skills and further, that reading comprehension is not a significantly different process from listening comprehension. It adopts, in other words, a "translation" definition of reading. A proposal of this kind has been made most explicitly by Sticht, but no serious empirical test has been made. Sticht himself, in his chapter (Vol. 1), describes a program of reading instruction in which considerable oral work takes place; but the written and oral activities are not clearly separated. A systematic effort to test Sticht's model ought to be made.

An important aspect of such a test should be attention to the possibility that separate instruction in oral comprehension may be effective in improving reading for certain kinds of materials or up to a certain level of complexity, but that beyond that point, the oral approach may become cumbersome or even totally ineffective. The existence of such a point would be strongly predicted by anyone espousing the notion of reading as an autonomous communication system. Arguments supporting this position can be made on the basis of skilled readers' ability to process written material far faster than people can speak. There is also evidence that skilled readers reading complex materials engage in a fair amount of "checking back" to earlier text, something not possible with oral presentations. These behaviors suggest different processes for reading than listening, at least in part. In addition, analyses by Olson (1977) and others of differences in the structure of written texts and oral communications suggest that written messages may be different enough in structure to require different processes than speech messages. If different processes are involved, then instruction in comprehending written material would be called for; transfer from oral comprehension could not be depended upon. These considerations suggest that we also ought to develop and test strategies for teaching written language-processing skills.

Direct Versus Informal Teaching. This brings us to our second question — what role direct instruction should play in teaching language skills. As already mentioned, there appears in these volumes a correlation of opinions: Those who advocate a focus on the code tend to advocate direct instruction; those who advocate a language-processing emphasis advocate looser, learner-directed instructional approaches. So widespread is this correlation of beliefs that we rarely question its appropriateness. Yet there is nothing inherent in a language-processing emphasis that requires informal teaching styles. To break free of the current, rather unproductive, confrontation between language and code advocates, one of the things we have to do is mentally "uncouple" informal teaching and language orientation. It may be that only learner-directed, informal teaching styles can bring about the functional uses of reading that language-oriented people stress. But it may be the case that direct instruction will work as well or better, especially if the processes involved in language comprehension, whether oral or written, can be better specified than they are currently. What we need to do, in the tradition of American pragmatism, is to "try it and see."

There are, then, two approaches to instruction in language processes to be explored: informal and direct. Consider the informal or child-centered method first. It might appear that this approach has had its chance and failed. Our look at the evidence from field research suggests no outstanding reading successes among

child-centered programs or language-experience methods except for the quickest learners and high-SES groups. These data provide no recommendation for informal teaching styles with children in compensatory programs. Yet I think it is the case that we have not yet seen a real trial of learner-centered methods. Such a trial would require using the best aspects of informal teaching systematically enough and in enough classrooms that we could find out both whether the approach is usable by a significant number of teachers and whether, when used, children learn to read well. The current state of informal education ideology and methodology precludes such a test. Programs and teaching strategies are described in the loosest terms; relatively few opportunities for extended apprenticeships exist; and teachers are thus forced to invent for themselves a good deal of what they do. Not all teachers are good inventors; few have enough years on the job to permit them to grope toward success. A first requirement then is that proponents of informal language-teaching approaches make their methods more accessible by specification, systematic training, and the like.

A serious test of the power of an informal, language-oriented approach to reading will also require sustaining the program over a relatively long period, at least several years. This may be difficult, especially in communities that have become used to watching test score data as indicators of the success of their schools, because the growth in language competence brought about by informal approaches may not be reflected in scores on tests now in use. A trial of informal approaches, therefore, may require use of achievement tests that are more sensitive to growth in language competence than our current ones appear to be. In other words, I am suggesting that child-centered, language-experience approaches to reading have not yet had a real trial in this country. To have such a trial, we would need both sustained commitment to it and attempts by those who believe in the power of these teaching approaches to develop more explicit ways of helping teachers implement them and measure their effectiveness.

The alternative approach is to develop systematic, direct instruction approaches to teaching comprehension and language-skill aspects of reading. Once we disengage the language-processing orientation from informal teaching methods, this becomes a prospect that can at least be considered. Such direct instruction in comprehension was the aim of the early basal reading systems. But the basal reading systems we inherited from the 1930s did not meet their originators' aspirations. Today's series reflect the successive waves of disenchantment with the basals in the variety of "add-on" activities that they incorporate — phonics units, language-experience activities, and so on. The possibility of direct instruction in comprehension apparently needs rethinking. Proposals for developing direct instruction approaches to teaching comprehension and writing deserve serious consideration at this time, as do proposals for expanding the knowledge base that might guide this development along profitable new lines.

Combining Language and Code Teaching

I have stated here that both code and language teaching will be required in successful reading instruction. How are they to be combined? The basic choice is whether to teach code and language simultaneously or successively. That is, both code and language aspects of reading can be the focus of instruction from the outset, or one can be emphasized first and then the other.

Successive Teaching. Successive strategies have been the most popular in the past and still dominate most thinking about teaching reading. Which should come first, in a given theorist's or practitioner's opinion, is very much a function of that individual's preferred definition of reading. Translation proponents — even when they recognize the need for some instruction and practice in language aspects of reading — want to emphasize the code at the outset and for as long as it takes for fluency to develop. Autonomous language system proponents want to begin with a meaning emphasis and let the code come later — if instruction in it is needed at all. Empirical evidence appears to support the code-first position. Initial emphasis on the code in a direct instruction program produces initial advantages and no long-term disadvantages. A language-first emphasis, at least in the versions

tried up to now, has not shown a clear advantage at either stage. Therefore, if a successive timing strategy is to be chosen, the current evidence argues for focusing first on the code. This sequence is in agreement with the stage theory of reading development outlined by Chall (Vol. 1), in which the first two stages of reading are concerned largely with learning the code and developing fluency and confidence in word recognition. (These stages follow a period of developing readiness, which includes attention to the function and meaning aspects of written language.) A code-first sequence also agrees with Adams, Anderson, and Durkin's (1978) recent position paper on cognitive processes in early reading. The authors argue that word recognition, word meaning, grammatical interpretation, and interpretation of logical interrelations among parts of the text are all active at all stages of reading but that at the beginning of reading, the new and most difficult task — and therefore the preoccupying one — is word recognition. Focusing instruction on the code, then, is a way of helping children at the beginning stages with their most difficult task.

Proposals for developing direct instruction approaches to teaching comprehension and writing deserve serious consideration at this time, as do proposals expanding the knowledge base that might guide this development along profitable new lines.

Simultaneous Teaching. Is simultaneous attention to code and language-processing aspects of reading possible? Might it alter the course of reading acquisition? We don't know the answer to either question, since a carefully documented simultaneous teaching strategy does not exist. Nevertheless, we can consider some possibilities and assess the likelihood of their being successful. I have already discussed the inherent difficulty of combining language and code emphases that derives from the code teacher's need for a carefully controlled vocabulary. But most code programs develop large recognition vocabularies relatively quickly, and the "conflict" might not have to last more than a few months. Elsa Bartlett (Vol. 2) suggests that one code-oriented program, *Open Court*, may be an example of successful early introduction of a rich variety of written materials. If materials of this kind can be used as the basis for direct instruction in language processing, then a very minimal delay between code and language foci can be envisaged. Bartlett's analysis of the program does not suggest how systematically or effectively the materials are used, but this is a case worth investigating, particularly because the program involved is coming into increasingly wider use with hard-to-teach populations (Bateman, 1977). According to Bartlett's analysis, *Open Court* is able to introduce richer-than-usual reading selections in part because it introduces elements of the code quickly and relies on children to be able to handle variability in print-to-sound translations. Many contributors to these volumes believe that a slower, more deliberate pace is needed for the hard-to-teach children in a compensatory education population. If they are right, then a long delay in language instruction might be required for these children. But a recent report (Bateman, 1977) suggests that *Open Court* is being used successfully with many hard-to-teach groups (compensatory, learning disabled, etc.). Certainly this trend should be monitored closely over the next few years.

Another alternative for simultaneous language and code emphases is to use informal, language-experience methods for language development simultaneously with a structured, code-oriented program. Strict code advocates are likely to claim that this will confuse children, who will encounter irregularly spelled words in the course of their informal work and who will be encouraged to guess and otherwise depend on cues other than orthography in their early reading attempts. We have no firm data on this, but informal observation suggests that most children are quite good at recognizing the different demands of different situations and would attend to the code during the formal instruction. A greater impediment, in my opinion, lies in the difficulty of school and classroom organization that the simultaneous use of direct and informal teaching seems to imply. Observa-

tions of classrooms in which a combination of direct and informal teaching is being tried suggest that one or the other aspect tends to be ignored, or at least given short shrift. Teachers complain about competing demands on their time, although they usually recognize that the children have plenty of time in the school day for both. My personal observation is that individual teachers, by temperament or training, seem to be good at one or the other kind of instruction and attendant classroom management, but rarely at both.

These observations lead me to propose, as an instructional approach worth development and trial in the schools, a reorganization of the school program so that informal instruction and direct instruction both take place but in clearly separated times and places and under the direction of different teachers. Various models for this separation are possible. For example, the school day might be divided into two halves — one for formal instruction, the other for informal. Or the "home" classroom could be organized along informal lines, with children assigned on a rotating basis to a skill center staffed by teachers who are proficient at teaching code and those language skills that seem to improve most through direct instruction. Whatever the particular arrangement, it is clear that seriously combining formal and informal teaching may require extensive reorganization of staff, time, and space allocations within schools. The effort may have some surprising side benefits, however, because it may solve problems of homogeneous versus heterogeneous grouping, "mainstreaming," cost-effective use of special reading teachers, and other problems that are difficult to contend with in the context of self-contained classroom organizations.

Summary and Conclusions

On the basis of the chapters included in these volumes, it is possible to identify two main strands of theory about the nature of reading. These are: (1) *reading as translation*, a view that holds reading to be essentially the translation of printed symbols into an approximation of oral language, so that already developed capabilities for understanding and using speech can be applied to written language; and (2) *reading as an autonomous language process*, a view that understanding the written word is in certain important ways different and separate from understanding spoken language. The two views of reading lead to different kinds of prescriptions for early reading instruction. Reading as translation suggests predominant attention to helping children master the alphabetic code. Reading as autonomous language suggests that reading instruction must focus quite directly on the functional and meaningful use of written language right from the outset of instruction. Both basal "look-say" methods and informal "language-experience" methods of teaching are attempts to meet this requirement in instruction.

Evidence clearly favoring one instructional approach over another in field settings is difficult to find. Nevertheless, a repeating pattern of findings concerning both what is taught and how it is taught can be detected if we examine several decades of applied research. This pattern can be summarized roughly as follows: When skill in word recognition is the outcome being studied, code-oriented programs tend to show up better than language-oriented programs. This is especially true for low-socioeconomic groups and for low achievers in general. However, when comprehension beyond the very simplest levels is the criterion, there is no clear advantage for either code- or language-oriented programs. Concerning instructional style — direct instruction, teacher-controlled use of time, and well-structured curricula have a clear edge — again especially for low-achieving or low-SES groups. These conclusions are drawn on the basis of evidence from: (a) several cohorts of Follow Through children; (b) Jeanne Chall's book, *Learning to Read: The Great Debate*, which reviewed studies conducted up to about 1964; (c) research reviews conducted by Guthrie and his colleagues for the National Institute of Education's compensatory education evaluation studies; (d) reanalyses of data from the Bond and Dykstra first-grade studies and the Educational Testing Service study of compensatory reading programs; and (e) the California Teacher Study.

These findings suggest several lines of action for national reading policy and for further development and study of reading instruction.

First, as a matter of routine practice, we need to include systematic code-oriented instruction in the primary grades, at least for hard-to-teach children, no matter what else is also done. This is the only place in which we have any clear evidence for a particular practice. We cannot afford to ignore that evidence or the several instructional programs already available or nearly ready for use that do a good job of teaching the code. There is no empirical evidence that too early or too much emphasis on the code depresses later comprehension. On the other hand, there is no evidence that code-emphasis programs alone will "solve" the reading problem. Such programs succeed well in teaching word recognition skills. They show no advantage, however, once comprehension becomes the main criterion of success (starting at about third or fourth grade). For this reason, we need to work on developing programs that do a good job of teaching the meaning and functional aspects of reading.

Two possibilities for such programs should be pursued. The language-experience approach, which builds on children's own writing and dictation, should be specified by its proponents precisely enough that it can be given a serious try in schools. Despite widespread interest in learner-centered, language-experience approaches, these methods have not been adequately described. Much is left to teacher invention, but not all teachers are well prepared for this task. A real trial of the language-experience approach will require a precise specification of the approach, its sustained use over several years, and quite probably, tests that are more sensitive to students' ability to use written language than our current ones appear to be. The second possibility for language-oriented reading instruction that should be investigated is direct instruction. For a decade or more, language-oriented approaches and informal, learner-centered methods of teaching have tended to be linked in educators' minds. This is not a necessary relationship, however. Just as we need to further develop and test language-experience approaches, we also need to explore direct instruction in comprehension. Such instruction may begin with oral comprehension skills, as is advocated by several of the experts who contributed to these volumes, or it may work directly on the comprehension of written material, as others advocate. In either case, success will probably depend on the emergence — now more than a vague promise, given new psychological research on language processing — of a detailed theory of the mental activities that take place during language comprehension. Thus, investment in "basic" research on how people understand written language can be expected to yield practical results for reading instruction within some reasonable, if not immediate, period of time.

Finally, attention will have to be paid to how to combine code and language aspects of instruction. A successive strategy in which code is emphasized first and language follows, or vice versa, is the most common today. The practical successes of code programs at the earliest grade levels, especially with compensatory education children, suggest that code should precede language if a successive strategy is used. However, simultaneous teaching of code and language aspects of reading may be even more effective, and several possibilities for such simultaneous teaching are suggested.

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A Whole-Language Comprehension-Centered View of Reading Development

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Editors' Note: *In this paper Kenneth Goodman and Yetta Goodman describe a whole-language comprehension-centered reading program and suggest ways to implement such a program in the classroom, including ways to modify a basal reader program. They list major assumptions related to the reading process, teaching and learning, and instructional materials. The emphases in this approach are on meaningful reading in which reading is its own reward, the student's language and experiences as a place to begin learning more about language, and the teacher's role as guide, facilitator, and "kid-watcher." Although the Goodmans' emphasis here is on the absence of structures, such as a controlled vocabulary, the reader should keep in mind that, in functioning as a guide and "kid-watcher," the teacher may use complex and less obvious structures which enable monitoring and responding to the needs and interests of each child.*

Introduction

John Dewey said education must start where the learner is, and help the learner to expand from there. His view of education placed the child at the center of problem-solving experiences.

A whole-language comprehension-centered approach to developing reading ability — and to all learning for that matter — is rooted in the child-centered, functional view that can be traced to such theorists as Dewey (1902). It builds on strength and minimizes preoccupation with deficiency. Research has demonstrated the tremendous language learning strength universally present among people of all backgrounds, including those who already speak two languages when they come to school and those whose home dialect is different from the teacher's (Goodman, Y., 1980).

In the whole-language, comprehension-centered method, literacy — the ability to read and write — is regarded as a natural extension of human language development. It is based on a cognitive psychology view of learning and the relationships among language, thinking, and learning, including views of perception, cognition, schema theory, and concept development. It involves a psycho-socio-linguistic view of language functioning and learning relating the individual to a socio-cultural view of language development and function.

We use this research base to support a view which is positive, building on existing strengths of the learner; relevant, expanding on existing experiences of children within their own cultures; transactional, treating the learners as active participants; personalized; dynamic; and process oriented.

Key Principles of a Whole-Language View

The holistic approach is based on the following key principles drawn from our scientific and humanistic bases.

The Reading Process

1. Meaning is constructed during listening and reading. The reader builds meaning drawing on prior learning and experience while interacting with the text.
2. Reading is a process of prediction, selection, confirmation, and self-correction. Effective reading produces coherent meaning. Efficient reading uses the least amount of energy and input necessary.
3. Three systems interact in language: grapho-phonic, syntactic, and semantic. These cannot usefully be separated for instruction without creating non-linguistic abstractions and nonsense.
4. Comprehension of meaning is always the goal of reading and listening.
5. Expression of meaning is always the goal of writing and speaking.
6. What the reader or listener understands beforehand strongly influences what is comprehended during reading or listening.

Teaching and Learning

1. Learning in school and out of school are not different. School programs must expand on existing learning and use intrinsic motivations. This means learning must be functional; it means literacy is an extension of natural language learning.
2. Development of function precedes and motivates development of form.
3. Language development builds expression and comprehension strategies *during functional, meaningful, relevant language use.* This means, among other things, that there is no sequence in which "skills" develop, and there is no hierarchy of language skills.
4. Children develop abilities in response to personal-social needs. They have already made strong beginnings in developing literacy before they have any contact with schools.
5. There is no one-to-one correspondence between teaching and learning. The teacher motivates, arranges the environment, monitors development, provides relevant appropriate materials, and provides timely experiences to facilitate learning. The learner extracts from that environment those elements which are most meaningful.
6. Though teachers may monitor development of strategies, learners need to focus on communication of meaning. That means there is a double agenda in the classroom: the learners focus on use and the teachers focus on use and development.
7. Risk taking is a necessary part of all language learning. Developing readers must be encouraged to predict and guess as they move toward meaning. An atmosphere must be created in which mistakes are seen as a necessary part of development.

Instructional Materials

1. Materials to be read in school must, from the very beginning, have all the characteristics of real functional language. They must be whole texts that are meaningful and relevant.
2. Fragmented exercises which turn real language into abstract bits and pieces have no place in this program.
3. Materials will be hard or easy in relationship to how predictable they are.
4. During instruction attention must shift away from words and toward comprehension of meaning.

Some of the major implications these principles hold for instruction follow:

Focus is always on meaning. The most important question is, How is this contributing to comprehension? Learners at all stages are urged to ask themselves continually, "Does this make *sense* to *me*?" They learn to judge their own success by what makes sense and to reject reading nonsense.

Motivation is intrinsic. No M & M's to reward effort or success are needed or permitted. Such reward distorts the purpose for reading. Relevant meaning is reading's own reward and the

only appropriate one. When language is functional, motivation to learn is high, and children know when they are successful since they have met their own needs. Extrinsic rewards can sugarcoat dysfunctional learning. At best the learner comes to rely on someone else's judgment that what has been learned is good.

The language of the bilingual child or the child whose dialect is of a different variety than the teacher's is accepted and expanded upon to develop flexibility in language use. *The school expands upon whatever base of language or languages a given learner brings to school.* In the case of the bilingual learner, the objective becomes biliteracy — the ability to read and write in both languages.

In this method there are no pre-reading skills, no formalized reading readiness. Instead, *learning is expected to progress from whole to part,* from general to specific, from familiar to unfamiliar, from vague to precise, from gross to fine, from highly contextualized to more abstract. Children are expected to read, first, familiar, meaningful wholes — easily predictable materials that draw on concepts and experiences they already have. These may be signs, cereal boxes, or books. From this perspective readiness is instrinsic when language is real. Children are ready when they see need and have confidence in themselves. By carefully building on what children already know, we assure their readiness.

In this method there is no sequence of skills or language units and no hierarchy for the ordering of instruction in skills or language units. *Beginners must use the same information as proficient readers to make sense of print.* Development is a matter of getting the process together: learning, in the context of reading real language, to use just enough print, language structure, and meaning and to keep it all in proper perspective. Development involves the building of comprehension strategies — ways of using information to construct meaning — that will help students become both efficient and effective in using this process. Readers, as they develop their strategies, must become more flexible as they move through broader ranges of materials with content further removed from their own direct experiences. The goal is to help readers to use reading to extend and acquire concepts.

The whole-language method does not require a controlled vocabulary — a concept based on a view of language as a set of words and of learning to read as learning words. A controlled vocabulary tends to lead to materials which are not realistic or meaningful. From a whole-language perspective, language self-controls vocabulary. In any text, of the 25 most common words, half will be function words (*a, the, is, was, in, it,* etc.) but the other half will be words closely related to story content. Furthermore, it takes three kinds of vocabulary to tell a story: a large number of incidental words, a small number of concept-carrying words, and very few crucial or plot-carrying words. Learning to read is not learning to recognize words; it is learning to make sense of texts.

The language of the bilingual child or the child whose dialect is of a different variety than the teacher's is accepted and expanded upon to develop flexibility in language use.

In this whole-language program there is no separate phonics instruction, in which children recode letters to sounds (such instruction assumes that the children can then "blend" the sounds and produce meaningful language). Reading doesn't work that way — the reader is seeking meaning, not sounds or words. Readers must be selective and use only as much of the print as is necessary to predict the meaning and confirm their predictions. Readers in a whole-language program do form rules for relating print to speech as they are reading meaningful texts. But these self-developed rules are not overlearned and artificial as they would be if they were imposed by a structured phonics program.

"Mastery learning" in reading is too often seen as breaking up the whole into small pieces, arranging them in a linear sequence, and making sure that each piece is thoroughly learned before the learners are permitted to go on to the

next. The simplicity of this idea is seductive. But chopping language into pieces turns it into abstractions which must then be re-assembled by the learners into a meaningful whole. Furthermore, the sequence in which the skills are presented is arbitrary and artificial.

Learning to read is not something that happens a piece at a time. Reading, like talking, is learned in the process of using language. There is no isolation of skills for instruction in this whole-language approach, and there is no isolation of processes from their use. The central principle is that *language is learned best when the learner's focus is on its communicative use.*

Most crucial in this whole-language method is the teacher, who serves as guide, facilitator, and "kid watcher." The teacher capitalizes on the language competence and language-learning ability of children and helps make literacy an extension of their natural language learning.

Implementation in a School Program

Children do not confine their learning to school. Much of their development occurs before they enter school and outside of school. The essential elements of an in-school program which is consistent with the principles outlined above and which draws on the learning taking place out of school are described below.

For the purpose of discussion, we will discuss this whole-language, comprehension-centered program under four headings: Reading in the Preschool, Beginning Reading, Developmental Reading, and Revaluing: An Alternative to Remediation. It will become obvious that this is a continuum with principles, objectives, activities, and materials common for all stages.

Reading in the Preschool

Among the literacy objectives of preschools are (1) to encourage what's already happening, that is, to build on children's developing awareness of functions of print, environmental reading, and informational reading; (2) to create a literate environment in the classroom — one in which functional print is everywhere; (3) to expand the learners' awareness of books and knowledge of how to handle them; and (4) to expand children's sense of the style and form of language by reading to them. The focus is on experience, awareness, and intrinsic motivation.

An important aspect of any preschool program is communication with parents to make them aware of opportunities they have for developing literacy in their children. Some specific activities include using and calling attention to written language; telling children what things say, encouraging them to say what they think something says; and increasing children's awareness of print.

At their preschool, children take walks around the neighborhood and school looking for environmental print and trying to decide what it says; they learn their name and the names of other children; charts and topical bulletin boards are created by the children and the teacher; teachers, aides, older students, and parents read to and with preschool children in small groups and one-to-one.

The preschool room has lots of books — response books and wordless picture books. There are centers for listening, where children follow books while listening to records or tapes, and for writing, where they create grocery lists, notes, and picture captions. The value of literacy is highlighted during role-playing experiences as children cook, go to store corners, or dress up in clothes centers.

Beginning Reading

Since we believe children have made a strong beginning in developing awareness of print and of its functions well before they enter the first grade, the term "beginning reading" refers only to the fact that children will be beginning a concerted program to help them become fully functional readers.

Everything we have said about attention to literacy in the preschool still applies but is a matter of more explicit concern at this stage. The program encourages children to be proud of their language, to be self-confident and self-reliant risk takers. Instruction is directed at helping children develop strategies to make sense of print. The teacher is a monitor and facilitator — encouraging children to seek meaning, to predict, to sample, to confirm, and to correct themselves. Children are encouraged to use all clues, not just words, to predict meaning

from language. The teacher of beginning readers monitors their development through close observation.

In a beginning reading program, the classroom is an environment in which functional, meaningful, relevant written language is everywhere. The print is created by the pupils and the teacher as they label their centers and the objects they contain: charts for rules, attendance, and jobs; bulletin boards for autobiographies of the children in the class; stores with boxes, cartons, and signs; and a classroom post office, where each child has a box for receiving "mail" and messages.

Learning to read is not something that happens a piece at a time. Reading, like talking, is learned in the process of using language. . . . The central principle is that language is learned best when the learner's focus is on its communicative use.

A variety of whole-language techniques is used in the beginning reading program. There are language experiences in which pupils dictate individually or in groups or write stories themselves based on their own experiences. These are recorded on charts or in books bound by pupils at a publishing center in the room. There are read-along activities where pupils follow a text while they listen to a record of someone reading. There are shared-book experiences, in which teacher and pupils read together an enlarged version of a favorite book or children's song or rhyme. There is assisted reading, where children read along with a teacher or aide who provides just enough support to keep the reader going.

There are also many predictable books in the classroom. These books are called predictable because they deal with familiar content in familiar language. They have simple, sometimes repetitious structures, making it easy for children to get a sense of where the book is going and to predict what will happen next.

The children are growing into literacy under the guidance of their teachers. They are not carefully taken into it skill by skill.

Developmental Reading

The part of a reading program which takes pupils who have made some beginning at reading and helps them to grow as readers is called a "developmental reading program." The program adheres closely to the principle that at all stages pupils must be reading comprehensible texts. No materials with artificial language are acceptable. The teacher builds pupils' level of confidence and encourages risk taking by encouraging them to choose materials they will want to read and want to comprehend. We expand their flexibility, help them develop and broaden their taste, and work with them to build strong comprehension strategies.

There are three focal points in developing a holistic program: (1) stimulating lots of reading; (2) creating a climate which accepts and encourages risk taking; and (3) keeping the focus on meaning — the teacher's and the students'. These points are the absolute minimum for the program. If they are not present, the program will not be successful, no matter how many specific activities that we've mentioned are used.

Since the major means of building proficiency is reading itself, plenty of time is provided for reading. Since language is learned best when it is self-motivated, self-selection is encouraged. Self-selection also helps in developing taste and flexibility. Children are helped to broaden the scope and range of their reading and to build specific strategies which will be helpful with different kinds of texts. They are encouraged to be active, rather than passive, in their own learning and to be interactive with the texts they read. Pupils do work hard and extend themselves to understand texts which are important to them.

Materials for the developmental reading program should be written with conscious consideration of the experiences, concepts, and interests of the intended audience. Subject area textbooks are limited resources to be used as one part of a total curriculum. In a holistic program teachers do not abuse and misuse texts by equating them with the curriculum and mak-

ing pupils totally dependent on textbooks for learning.

The program offers patience and progress toward development of comprehension strategies, instead of drill on skills. Comprehension strategies focus on use of graphic, syntactic, and meaning cues in the context of real whole language. Strategy lessons expand on strengths and help pupils build strategies of sampling, predicting, confirming, and correcting by using meaningful passages that offer many unambiguous opportunities to use the strategies.

Here is an example. We have noted that pupils in reading sometimes substitute *what* for *that* and *that* for *what*. As we pay closer attention, we find they also do this with *when/then* and *where/there*. Rather than isolate these for drill or assume they indicate a phonics problem, we determine that these substitutions tend to occur where either word could make some sense and fit grammatically. So we find or write a meaningful passage in which each time one of these words is used it is the only one that can fit. Our purpose in having the pupils read the passage is to help them use and strengthen self-correction strategies. But we will also be helping them to make better predictions. At no time do we explicitly call their attention to these words in isolation. That would strengthen an association between the words.

Specifics of a developmental reading program include lots of time spent reading, time for periods of sustained silent reading of books children select themselves. Books with a wide range of topics and difficulty are available to the children. In addition to trade books and school textbooks, the program also uses TV guides, newspapers, environmental reading (signs, boxes, ads), and paperbacks of all kinds. The program employs reading materials from libraries, homes, the community, hobbies, crafts, and informational sources. It cultivates reading in the pursuit of personal interests. Students are helped to understand their own cultural background by having available many materials that represent the multi-lingual, multi-dialectal, and multi-cultural nature of our society.

Particular concern is given to the reading of content materials in math, science, and social studies. Students work at the development of special strategies for reading these materials.

For example, a general strategy for reading math problems encourages pupils to read them three times — once to decide what information is being sought, a second time to lay out equations and computations, and again to get specific information and check against the problem. Each successive reading employs different strategies for different purposes.

In planning for reading development in each content field, teachers are encouraged to use the following general approach. First, they review the general and special uses of reading in the area. Then they consider what new kinds of texts pupils will encounter — for example, maps, charts, recipes, directions, or scripts. Next, they decide what strategies, background knowledge, and resources are needed. Determining where the pupils are with respect to the necessary strategies, background knowledge, and resources comes next. Such careful planning, organizing, and evaluating makes it possible to facilitate the pupils' interaction with the texts so that strategies are built and comprehension strengthened.

Revaluing: An Alternative to Remediation

In our experience troubled readers — those who are considered by themselves or others to be not effective — are in conflict with themselves. In a true sense, they are their own worst enemies. They try to make sense out of what they read, but they also try to do it by the numbers, to remember and use every skill they've been taught. They are so busy attacking words that they lose confidence in themselves as language users. They mistrust their own language strategies and become dependent on teachers to tell them what to do as they read. They are very reluctant to take risks, and their confidence level is low.

Troubled readers believe that there are two kinds of readers — good and bad. And they believe they are bad readers. Good readers, in their view, never have problems. Troubled readers believe that the subskills work for good readers, so these pupils suffer from the "next-word" syndrome. Every time they come to a word that is unfamiliar, they take it as proof that

they are bad readers. Good readers, they think, always know the next word. Troubled readers treat all words as equally important, so they spend as much time trying to sound out a name as they do an important concept-carrying word. They give up on meaning, they don't expect things to make sense, and reading becomes the tedious task of getting as near to as many words as possible. They believe that if they get to meaning without systematic use of skills, they've somehow been cheating. Remedial programs that concentrate on areas of weakness only serve to aggravate the problems.

These pupils must be patiently helped to revalue the reading process and revalue themselves as learners and readers. The focus in a holistic program on revaluing helps pupils to build risk taking, to build confidence, and to become aware that they have personal choices and alternatives. We build toward the readers' sense of their own strengths. We help them to value what they can do and not be defeated by what they can't do, to trust themselves and their linguistic intuitions.

Instruction for troubled readers seeks to move them away from the next-word syndrome and total reliance on phonics and to help them build meaning-seeking strategies. They have to learn to accept their own miscues as legitimate and to find satisfaction in getting sense from what they are reading.

Specifics of a revaluing program include a great deal of whole-language, meaningful reading and of non-pressuring support. Patience is a key ingredient in working with troubled readers. We expect some setbacks and considerable trauma as the pupils get control of their conflict with themselves. But we continually demonstrate to pupils that understanding the meaning of what they are reading is the primary goal.

It is particularly important that troubled readers have the support at all times of a full, meaningful, real-language text. Almost invariably, they have been subjected to an increasingly meaningless set of skill drills which have turned reading, for them, into disconnected abstractions. The goal of the revaluing program is to help troubled readers put themselves and reading back together.

Moving to a Whole-Language Approach from a Basal Reader–Centered Program

The most likely common denominator in contemporary classrooms is one or more basal readers. Teachers and schools wanting to shift toward a whole-language, comprehension-centered approach may find that the most practical means of doing so is to modify their use of the available basal readers. This can be accomplished, except in those cases where the basal is too tightly structured and skill based. Here are some steps.

The teacher must modify his or her use of the manual. The teacher should develop a set of comprehension-centered criteria for deciding which advice in the manual is worth following, which activities are worth including, and which selections are useful. Control shifts in this process from the manual to the teacher.

The basal becomes one resource among many in the classroom. In most cases, the stories and other selections beyond the primers and preprimers in basals are reasonably good. They draw on well-written children's literature, and they have lost some artificiality and incorporate more ethnic and cultural diversity than earlier basal readers.

Here are criteria which can be used in selecting stories from the basals: (1) language must be natural and not fragmentary or artificially controlled; (2) predictability of language forms and content should be reasonably high; (3) content should be relevant and interesting to the pupils; and (4) illustrations should support but not replace the language of the text.

In a holistic program all pupils don't have to read the same stories in the same order. Some selections may be of little interest to some pupils, some may be irrelevant to some populations, some may be better used earlier than others. Pupils may read some stories and discuss them with others, or they may read them as they become interested in them.

The key is to retain only those parts of the basals which are compatible with the criteria of the whole-language, meaning-centered program. Only a few selected skill lessons and parts of the workbooks screened through the criteria will prove useful. An occasional item that con-

tains a meaningful passage of some length, that focuses on comprehending, or that involves content relevant to the pupils may be adaptable as a strategy lesson.

Some commercial programs have been designed with more focus on whole language and meaning than others. Bill Martin's *Sounds of Language* (Holt), *Reading Unlimited* (Scott, Foresman), *Breakthrough to Literacy* (Bowmar, Longmans), and Van Allen's *Language Experience in Reading* (Encyclopedia Britannica) are examples. In addition, there are a number of publishers who offer paperback book packages, read-along libraries with records or tapes, topical newspapers (Scholastic, Weekly Reader), and other materials compatible with a whole-language approach. Scholastic now provides packs of paperback books keyed to extending themes in specific basal readers. Resourceful teachers can even take discarded basals and cut them apart to place in folders or binders the stories that they know children like and that meet the criteria of being whole, real, meaningful language.

There is little useful information to be gained from the results of a published test administered in half an hour that a teacher can't obtain from directly monitoring the reading of pupils and interacting with them daily.

We accept the reality that teachers need to accommodate new ideas gradually and to plan for a transition from what they have done in the past to a new program consistent with new criteria. In this transition, the teacher can keep the best of the old, eliminate strategies and materials that conflict with the new criteria, and integrate new concepts with the old in a new perspective. What makes this process work is a belief in the strengths of pupils and a concerted attempt on the part of the teacher to shift from a deficiency view to a positive view that accepts and builds on pupil strengths.

A willingness to take risks is essential for pupils to become literate. It is also essential for teachers. Nothing is more important in this program than informed teachers who understand language and who care about their pupils. They know how to observe and monitor the progress pupils are making in developing literacy. They observe pupils using language — speaking, reading, and writing — and informally apply their knowledge of language development to achieve an understanding of the pupils' strengths and needs.

Teachers evaluate this program on the basis of evidence that pupils use comprehension strategies. They watch for signs of effective, efficient use of sampling, predicting, confirming, and self-correcting. They watch for evidence that readers are trying to make sense of written language.

Evaluation of reading development must include self-evaluation. Teachers involve children through individual conferencing in self-evaluation and planning for continued reading development. The readers should be continuously asking *themselves*, "Does this make sense?" The most important question a teacher can ask to assist in this process is, "Did that make sense to you?" The corrections pupils make of their oral reading miscues are strong indications of their self-monitoring for meaning. If pupils are correcting miscues which reflect meaning loss and not correcting miscues which don't, then they are showing concern for meaning.

There is little useful information to be gained from the results of a published group test administered in half an hour that a teacher can't obtain from directly monitoring the reading of pupils and interacting with them daily. But this requires that teachers know a great deal about their pupils, about how reading works, and about how it is learned.

In some instances, teachers use miscue analysis to get a full profile of a pupil. It is a window on each pupil's use of the reading process, and it reveals developing strengths as well as plateaus and hang-ups. But in most cases, the teachers use the analysis informally to gain a sense of pupils' progress. What is important is that teachers, as skilled professional observers, are continually engaged in evaluation while they interact with pupils (Goodman and Burke, 1980).

Conclusion

School districts will not find this an easy program to put into effect if the focus of their teachers, reading programs, and administrators is on subskill teaching to raise test scores. It has been proved often that what is taught by rote can be retrieved for short-term specific purposes. Certainly teaching for the word attack skills that will appear on a standardized test will raise the scores on that test, at least in primary grades. However, these test scores do not really show the development of effective reading proficiency. Some students learn to read despite low test scores. Some overcome skill instruction and learn to read but also learn to hate reading because it is a tedious process. Others never catch on to what reading is really all about. They keep applying skills and getting no meaning from what they read. Reading remains an instructional activity for the latter group and never a pleasurable, useful, personal experience. The group of people who do learn to read and to enjoy it have high and low reading test scores. They develop reading strategies on their own — often without benefit of instruction that could help them develop flexibility in reading.

If administrators and teachers can accept the view of learning to read as a natural process which occurs in environments where reading is a meaningful and functional part of all the learning experiences in and out of school, then developing a whole-language, comprehension-centered program will be easy. These teachers build on what they know about language and learning to read. They organize an environment in which reading is used by students to learn about significant aspects of the total human experience. Such a program requires that principals and parents respect teachers as professionals and children as learners and expect both to be responsible and productive.

In a whole-language, comprehension-centered program, reading is not separate from other learning. It becomes an integral part of all the learning experiences students have during their school day. Reading becomes a tool to gain knowledge, to participate vicariously in the experiences of others, to question the views and statements of others. Students must see reading as significant to their own lives. This can be accomplished when reading is a means to more significant experiences. It is in such a setting that reading is developed naturally. As the focus of teaching reading shifts from a highly directed structural program to a program where reading is always a means to an end — always one part of a whole-language, comprehension-centered curriculum — reading takes its proper place.

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Direct Instruction: A Bottom Up Skills Approach to Elementary Reading Instruction*

Douglas W. Carnine
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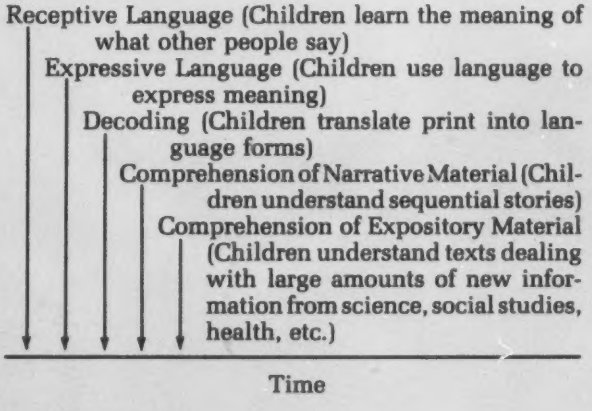
Editors' Note: *Douglas Carnine describes a direct, highly structured reading program with a subskills or decoding emphasis. The paper presents a rationale for taking that position and gives details about how such a program operates. Although the author's experience and most of his references relate to a specific program, many of these ideas are relevant to other highly structured approaches to instruction. Dr. Carnine organizes his paper around six aspects of teaching basis skills: a sequential scope and sequence of reading skills; procedures for evaluating and modifying a reading program to meet the needs of different students; presentation techniques; the focus on time spent in reading instruction; and the orchestration of instruction so that students' individual needs are met.*

Success in reading is very important to students for a variety of reasons — for academic and vocational advancement, for enjoyment of literature and many other kinds of printed materials, and for general psychological well-being. It is important for schools to demonstrate that they can help all students achieve success in reading. Although problems such as poverty, a disruptive home life, and physiological impairments can make this task difficult, these problems must not be used as excuses for the poor performance of students. With the support of the administration, teachers can bring about significant improvements in reading achievement without changes in children's economic and social environments.

While most reading educators would agree that schools can and must provide students with successful school experiences, these same educators would not necessarily agree about how to define reading or how to teach it. The following discussion of what is meant by reading and how students learn to read reflects a particular viewpoint — a viewpoint in support of a direct instruction approach to subskills teaching. Other viewpoints are presented elsewhere in this handbook.

From a subskills perspective, the reading process is best understood as part of a language arts continuum. While the continuum below does not reflect the complex interactions that exist, it does provide a developmental framework for viewing the language development and reading process.


Receptive Language (Children learn the meaning of what other people say)
Expressive Language (Children use language to express meaning)
Decoding (Children translate print into language forms)
Comprehension of Narrative Material (Children understand sequential stories)
Comprehension of Expository Material (Children understand texts dealing with large amounts of new information from science, social studies, health, etc.)
Time

As educators know, students do not progress along the continuum at equal rates. Some students progress quite rapidly, others slowly. The challenge facing educators is to help each student experience as much success as possible. To meet this challenge, professionals must make some new, rather different assumptions about how children learn. The first is that children are *constructionists*, which, in part, means they continually strive to create meaning from the environment. A second, often overlooked, assumption is that students have a limited amount of capacity for processing information. Children with backgrounds where they have had frequent, academically oriented verbal interactions with adults tend to be better at creating meaning (at least in a verbal sense) and at processing information. Children from other backgrounds often require instruction that fosters meaningful learning without making unreasonable information processing demands. A subskills orientation attempts to provide that type of instruction.

> One of the major premises of the subskill approach is that reading is not a natural language process and that learning to read requires specific instruction. Another assumption is that reading, as a complex skill, is comprised of subordinate units that must be mastered and integrated to form higher order skills. Consequently, to accomplish this developmental task, a variety of subskills thought to be essential are taught routinely to students. The order of progression in these skills is from prerequisite smaller units to larger units. (Samuels, 1980, p. 207)

The subskills orientation makes meaningful learning more likely for students by reducing the information load, simplifying the learning act, and allowing for mastery learning. Teaching smaller units is one way to simplify learning, and probably the most sensible. LaBerge and Samuels (1974) suggested that the sequence in learning to decode (word attack skills) is from distinctive features to sounding out letters, then letter clusters, and, finally, words. Identifying letters according to distinctive features is simpler than recognizing words according to sentence context cues, picture cues, initial letter cues, word configuration cues, and so on.

A recent metastudy (a study of studies) based on research reported in the *Reading Research Quarterly* (Pflaum et al., 1980) suggested the importance of teaching letter sounds. The only significant finding concerned the effectiveness of one aspect of phonics — teaching letter-sound correspondences and blending as a means of introducing word reading. None of the other classes of studies dealing with decoding or comprehension showed significant effects. Although learning letter-sound correspondences is not in itself particularly meaningful, it does contribute to *accuracy* (and success) in initial decoding. Though this pattern of teaching is initially less "meaningful" to the child, it enables him or her to gain confidence, build skills, and develop skills rapidly.

The subskills orientation makes meaningful learning more likely for students by reducing the information load, simplifying the learning act, and allowing for mastery learning. Teaching smaller units is one way to simplify learning, and probably the most sensible.

Prior teaching of subskills also makes later learning of more complex skills easier. This is, in part, because of the reduced information load. Teaching students word attack skills based on the letter composition of words usually makes sentence reading easier for students. As students become proficient at sentence reading, the word attack skills become automatic, without the reader being aware of their application. However, for the beginning reader, the skills are not automatic and the information load is great. In the 1971 edition of *Understanding Reading*, Frank Smith noted that

> the mere fact that a child cannot read very fast puts a heavy burden on memory and attentional systems that are both inexperienced and overloaded with all kinds of instructions and rules. By the time the novice has built up enough speed to take some of the strain off his memory, many of the earlier rules have become unnecessary or overlearned and automatic, and the memory load is reduced in any case. (p. 3)

Another advantage of the subskills orientation is that it is suitable for applying a mastery

*This paper is adapted from *Direct Instruction Reading* by Douglas Carnine and Jerry Silbert with the permission of the publisher, Charles E. Merrill, 1300 Alum Creek Drive, Columbus, Ohio 43216.

learning system. Subskills can be practiced until they are mastered and then they can be integrated to form more complex components. Ultimately, the students will use all of these components in unison, but not all components need to be learned simultaneously (Case, 1975). When some components are learned earlier, less information processing capacity is required in learning the more complex skill. Thus, mastery learning of components makes learning a complex skill easier. (See Samuels, 1980.)

As students become better at analyzing words based on letter composition, they also increase their use of context cues. An awareness of the letters that make up a word and of the context within which the word occurs contributes to accurate decoding and comprehension. For beginning readers, letter composition is more important because students have difficulty taking advantage of the few context cues available in early readers (Samuels, 1980).

Subskills are not, of course, an end in themselves, but a means. Decoding or word attack skills could be considered a very large subskill of comprehension. Reading requires accurately translating printed words into some language form (decoding) to produce meaning (comprehension). Students must translate a message with some accuracy before they can comprehend it. Otherwise, fragmentary guessing procedures develop.

Research on Comprehensive Subskill Interventions

Since detailed research reviews of skills-based orientations toward reading instruction are available elsewhere (e.g., Carnine and Silbert, 1979), only brief mention of selected studies will be made here. After conducting an extensive review of the research literature on teacher effectiveness, Rosenshine (1979) summarized the variables that were associated with student academic success as "direct instruction":

> To give an overview of the results, direct instruction refers to high levels of student engagement within academically focused, teacher-directed classrooms using sequenced, structured materials. As developed below, direct instruction refers to teaching activities focused on academic matters where goals are clear to students; time allocated for instruction is sufficient and continuous; content coverage is extensive; student performance is monitored; questions are at a low cognitive level and produce many correct responses; and feedback to students is immediate and academically oriented. In direct instruction, the teacher *controls* instructional goals, *chooses* material appropriate for the student's ability level, and *paces* the instructional episode. Interaction is characterized as structured, but not authoritarian; rather, learning takes place in a convivial academic atmosphere. (p. 38)

Although the research Rosenshine reviewed focuses on the achievement of low-income, primary-grade students, other researchers report similar results with other types of students.

A federally funded ten-year study called Follow Through evaluated several major approaches to educating low-income, primary-grade students. Direct approaches were compared with a language experience approach, Piaget's stages of learning, child development theory, discovery learning, and open education. Only students in a direct instruction approach consistently outperformed control students on basic, cognitive, and affective measures. Guthrie (1977) summarized the Follow Through results in this way:

> Final answers about teaching are not available from this study (Follow Through) — nor will they ever be — no more than final answers about medicine, engineering, or poetry. A fully complete explanation of education is not likely, since values of the public and research methods are constantly shifting. However, the results of the Follow Through experiment endow us with evidence about the effects of teaching programs at an unprecedented level of certainty. The edge that the more successful programs have over the less successful programs is wide enough to serve as a foothold in the climb to improved, intended education. (p. 244)

Ingredients for a Successful Program

If teachers are to effectively and efficiently teach reading following a direct instruction subskills approach, they must be knowledgeable in several areas, which comprise the major topics of discussion in the remainder of this paper:

1. *Scope and sequence of reading instruction* — knowing the essential skills or objectives that make up the reading process and when to teach them. While knowledge of a

scope and sequence for reading instruction is far from complete, educators can improve student performance by applying available knowledge. The thousands of students who are now failing in school cannot wait for more knowledge to be gathered.

2. *Program design* — knowing procedures for evaluating, selecting, and modifying reading programs to meet the needs of all students in their classrooms.
3. *Presentation techniques* — knowing techniques for effectively presenting lessons or activities, including techniques for motivating students, diagnosing and correcting their errors, and pacing tasks.
4. *Academic engaged time* — knowing how to organize classrooms so that the amount of time students spend engaged in reading instruction is maximized.
5. *Classroom orchestration* — knowing how to individualize instruction by properly placing students in a program and then moving them at an optimal rate through the program, based on frequent evaluation of their learning.

Teaching can be defined as the intentional arrangement of both the physical and the interpersonal environment to ensure student success and growth. The ways in which administrators and parents can contribute to this optimal environment must be considered and will be touched upon here. Textbook publishers and colleges of education also play important roles, many of which can be inferred from the discussion of how to teach reading which follows. A final note: The effectiveness of a skills approach to reading instruction depends not only on the teacher's knowledge but also on his or her dedication to excellence. A teacher's commitment is essential for the success of many students.

Scope and Sequence

The scope and sequence of reading instruction can be conceived of as three developmental stages: beginning, primary, and intermediate. In the beginning stage, emphasis is placed on decoding and oral language. In the primary stage, equal emphasis is placed on decoding and comprehension. In the intermediate stage, the emphasis is on comprehension of narrative and content area material. A more detailed discussion of scope and sequence appears in *Direct Instruction Reading* (Carnine and Silbert, 1979).

Program Design

Teachers must be able to evaluate reading programs so they can select those that will best meet their students' needs. In addition, they must be able to design lessons for teaching specific skills, which often requires modifying or supplementing certain aspects of a commercial program. Six aspects of direct instruction program design are relevant when selecting a reading program, writing lesson plans, modifying reading programs, and writing IEPs (Individualized Education Plans): (1) specifying objectives; (2) devising problem-solving strategies; (3) developing teaching procedures; (4) selecting examples; (5) providing practice; and (6) sequencing skills and examples.

Specifying objectives. Objectives must be stated as specific, observable behaviors. Saying that students will be decoding at first-grade level by the end of first grade is not specific. The type of words the students will be expected to read must be specified, along with accuracy and rate criteria. The way in which the words will be presented must also be described, for example, in lists or in passages. For passage reading, the readability (complexity of sentence length or structure) should also be specified.

Objectives of a program should be carefully evaluated according to their usefulness. Since teaching time is limited, skills should be listed in order of importance, with those skills defined by the school as essential being taught first. If time allows, less essential skills can also be taught. Setting priorities for skill development is important, since most programs contain more objectives than students can reach.

Devising problem-solving strategies. Whenever possible, programs should teach students problem-solving strategies rather than require them to memorize information. A strategy is taught using a limited set of examples and is then applied to new examples. For instance, students who know the sounds for the letters *m*, *t*, *r*, *s*, *f*, *d*, *a*, *l* and *o* can be taught a sounding-out strategy to decode regular words like *mat*, *Sid*, *fat*, and *mom*. Once the students master the

sounding-out strategy with these words, they can use the same strategy to read words like *sit, mad, ram, it, am, Sam, rod,* and *rid.* Although some students learn strategies without their being explicitly taught, many students do need explicit instruction.

Developing teaching procedures. After objectives are specified and a strategy has been devised, the strategy must be translated into a *format* that specifies how the teacher will present the strategy. Providing detailed formats is very helpful because teaching involves very specific behaviors. Teachers do not teach students to *decode* words in some abstract fashion. They point to particular words, give information, ask questions, and so on.

Formats often contain two stages. In the *introduction* stage of a format, the teacher demonstrates the steps in a strategy and then provides structured practice in using the strategy. The teacher makes the steps in the problem-solving strategy overt so that the students can see how to approach similar examples. In the *discrimination* stage, the student operates with little or no teacher help and is given examples which do and do not call for use of the newly taught strategy. The student internalizes the strategy, learning to apply it without guidance from the teacher.

Selecting examples. Selecting appropriate examples is a critical part of format construction. Examples at the introduction stage are appropriate only if the student can use the new strategy to come up with the correct answer. For example, when teaching students to decode regular words, the examples would be limited to words that contain only the letters for which students have been taught the letter-sound correspondences. If the students know the letter-sound correspondences only for the letters *m, s, a, d, f, r, t,* and *i,* the teacher should not present *met* since it has an unknown letter (*e*).

Selecting appropriate examples for the discrimination stage is more complex. In addition to examples of the new strategy, other examples must also be included. These other examples review previously taught strategies and are in some cases similar to the new examples. A range of examples is necessary so that students are required to differentiate when to use the new strategy and when to use previously taught strategies. For example, after glossaries are introduced, students must learn when to apply a contextual analysis strategy to determine the meaning of an unknown word and when to use the glossary.

Providing practice. Learning to read requires lots of practice. Hundreds of repetitions of the same skills may be necessary for some students to become mature readers. Therefore, sufficient practice must be provided within each lesson and across lessons. When a new strategy is introduced, practice must include a concentrated or massed presentation of examples, if the student is to master the strategy. Review across several lessons is needed to ensure that students retain the strategies and information taught in a reading program. A pattern of massed practice in the first several lessons and systematic review later is critical for retention.

When reading programs do not supply sufficient practice, teachers must insert supplementary exercises. Game activities, for example, can be used to provide practice on reading skills while still maintaining a high degree of student interest.

Sequencing skills. Sequencing involves determining an optimal order for introducing new information and strategies. Sequencing significantly affects the difficulty students have in learning some skills. Five sequencing guidelines tend to reduce student error rates:

1. Preskills of a strategy are taught before the strategy itself is presented.
2. Instances that are consistent with a strategy are introduced before exceptions.
3. High utility skills are introduced before less useful ones.
4. Easy skills are taught before more difficult ones.
5. Strategies and information that are likely to be confused are not introduced at the same time.

Presentation Techniques

Even when teachers have well-designed materials, they still need presentation skills that will result in an optimal communication of the material. Different presentation techniques are

appropriate for different stages of reading instruction. During beginning reading, for example, direct instruction involves small-group teaching with little independent work; later, the amount of small-group instruction decreases, and the amount of independent work increases. Similarly, for young children, feedback on practice activities should be immediate; for older children, it can be delayed.

Overall, a primary-grade teacher must be proficient in the variety of presentation techniques needed to maintain student participation in question-answer exchanges between teacher and students. Intermediate-grade teachers must be more skilled in managing students who are working independently. In both cases, teachers must convey warmth and active demandingness, two aspects of effective teaching identified by Kleinfeld (1975):

> The first and most important characteristic is the effective teacher's ability to create a climate of emotional warmth that dissipates students' fears in the classroom and fulfills their expectations of highly personalized relationships. The second characteristic is the teacher's ability to resolve his own ambivalent feelings about the legitimacy of his educational goals and express his concern for the ... students, not by passive sympathy, but by demanding a high quality of academic work. (p. 318)

The remainder of this section explains some of the teaching techniques that characterize direct instruction. Although most of the examples used involve situations in which younger students are being taught, teachers of older students, especially remedial students, should find much of the discussion relevant.

Small-group instruction. Small groups are recommended for beginning reading instruction because instruction requires frequent oral responding, which in turn calls for teacher feedback. This feedback can be most economically provided through small-group instruction. Although students would benefit from extended periods of individual attention from a teacher every day, most schools cannot afford one-to-one teaching for more than a small number of special students.

In small-group instruction, while the teacher works with one group, the others work independently. By working with groups of 5 to 10 students at a time for half an hour, the teacher can provide students with much more teacher instruction in reading every day than would be available if the teacher worked with individuals. Whenever possible, the teacher should make the group with higher performing students the largest and the group with lower performing students the smallest. This ensures that the lower performing children have the greatest opportunity for direct teacher evaluation.

A critical aspect of small-group instruction is the building of homogeneous groups of students with similar skills. Such groups allow for more individualization because students with advanced skills can progress quickly through a program while less advanced students receive the extra practice they need. To form homogeneous groups, the teacher divides the students into groups according to pretest performance. Although pretests indicate the skill level of a student at the beginning of a program, they cannot predict how quickly the student will learn new skills. Consequently, teachers should expect to do some regrouping throughout the year. Groups should be treated as flexible and fluid, with group membership changing to best meet each student's needs.

Unison oral responding. Another critical feature of efficient small-group teaching in the early primary grades is active student involvement. Unison responding, in which all the students respond at the same time, is one way to facilitate a high degree of active student involvement. With younger students, the ratio of teacher talk to student response should be low. That is, teachers should not talk for long without calling for a response to ensure that students understand what has been said.

Pacing. Appropriate pacing contributes to student attentiveness and reduces errors. Younger students are usually more attentive to varied, fast-paced presentations (as in "Sesame Street") than to slow ones. However, providing a fast-paced presentation does not mean that a teacher rushes students, requiring them to answer before they have had time to determine the answer. The key to providing a fast-paced presentation is to begin the directions for the next question (or for the correction to the current answer) immediately after the students make a response.

Monitoring. Monitoring student performance in the late primary and intermediate grades is relatively simple (although time consuming) because assignments are written. In contrast, monitoring the performance of early primary-grade students who are responding in unison orally is not easy. When several students respond at the same time it can be very difficult for the teacher to hear mistakes made by only one or two of the students, especially when an error sounds similar to the correct response.

Individual tests are an important monitoring tool because they provide a more accurate indication of mastery than a unison response. If the student makes a mistake when responding individually, the teacher provides more group practice and tests individually again later.

Diagnosis and correction. In diagnosing the cause of a student's error during small-group instruction, the teacher must first decide whether the error resulted from a lack of knowledge or from inattentiveness, since the cause of an error determines which correction procedure is appropriate. The teacher corrects errors caused by inattentiveness by working on increasing the student's motivation to attend.

When errors result from a lack of knowledge, the teacher must try to determine the specific skill deficit that caused the error. This process, called diagnosis, involves identifying deficits based on recurrent error patterns, not on random errors. The diagnosis procedure is basically the same whether the response is oral or written. If, for example, in a critical reading exercise a student labeled items "a" and "b" below, which illustrate false attribution, as examples of the testimonial propaganda technique, the diagnosis would be a confusion of the testimonial and false attribution propaganda techniques. After making the diagnosis, the teacher would correct the errors, pointing out that a testimonial involves famous persons endorsing ideas or products outside their area of expertise. In contrast, in false attribution a claim based on a single attribute leads to a claim concerning the entire product.

a. The IRA brand car has the loudest stereo of any car in its price range. The IRA car is the best car in its price range to buy.

b. The XYZ brand pacemaker is the cheapest one on the market. If you need a pacemaker, buy XYZ brand.

The correction procedure used in small-group instruction consists of as many as six steps: praise, model, lead, test, alternate, and delayed test. For example, in a beginning reading task the teacher points to *o* and asks, "What sound?" A student responds, "/u/." First the teacher *praises* other students who responded correctly. (The purpose of this praise comment is to prevent students from making errors in order to gain teacher attention and also to maintain a positive atmosphere during instruction.) Second, the teacher *models* the correct answer saying, "ooooo." Third, the teacher may *lead* (respond with them). A lead provides a model as the students respond, ensuring that they hear a correct response. Leading is needed only when students have difficulty making the response (saying the sound). Fourth, the teacher *tests*, asking the students to respond correctly. The teacher continues the test by *alternating* between the missed example and other examples. The last step is the *delayed test*, in which the teacher tests the student individually on the missed example at a later time in the lesson.

The correction procedure is somewhat different for more advanced items — the teacher simply models a strategy for answering an item and then tests. For example, let's say the students have read a science passage containing the rule, "when objects are heated, they expand." They then work on written exercises of this form: "A metal ball was left outside. It was 40° in the morning. In the afternoon it was 95°. What do you know about the size of the metal ball in the afternoon?" A student responds, "It gets smaller." The teacher would first test to determine the specific cause of the error. Does the student understand critical vocabulary terms (*expand*, in this case), and does she know how to apply the rule? If the student does not know how to apply the rule, the teacher models by asking a series of questions. "What's the rule that tells about temperature and size? What was the temperature of the ball in the morning? What was the temperature of the ball in the afternoon? Did the ball get hotter? Then what happened to its size?" A balloon could be deflated or inflated to illustrate student responses. The teacher continues testing until the student makes three or four correct

responses in a row to ensure that she is not just guessing. Later in the lesson the teacher would present a delayed test.

Motivation. Some students come to school eager to learn and eager to please the teacher. They respond well to simple praise. They work hard and have pride in their work. With such students, motivation is not a concern. Other students have little interest in learning and are not as eager to please. The teacher must accept these students regardless of their attitudes and use techniques to develop an interest in learning. A first step in motivating these students is demonstrating to them that they can succeed in reading. This is done by carefully designing and effectively presenting lesson plans. A second step is showing students that there is a reward in learning to read. At first, the teacher may use extrinsic rewards like physical contact, tickles, pats, and handshakes, eventually, working toward developing intrinsic motivation in the students. This is a critical step in enabling students to make their school experience successful and satisfying.

Academic-Engaged Time

Rosenshine and Berliner (1978) discuss the necessity of adequate academic-engaged time if students are to succeed in school. *Reading-engaged time* refers to the time students actually spend on reading exercises and activities. They point out that in several studies, time spent in reading yielded higher correlations with achievement in reading than any other teacher or student behavior studied. Note that engaged time does not refer to scheduled time, but only to the time students spend engaged in reading activities. Rosenshine (in press) reviewed studies that found only about 80 percent of the 85 minutes allocated to reading per day in second grade were academic-engaged minutes, and in fifth grade, about 75 percent of the 113 minutes were engaged minutes. In classrooms with little student improvement in reading over a year, only a few minutes were spent on fundamental reading skills each day.

Engaged time must be put to good use. First, if students are expected to learn to read, they must be engaged in reading-related activities. Stallings (1975) found positive and usually significant correlations between standardized reading achievement test scores and engagement in reading activities. On the other hand, time spent on stories, arts and crafts, active play, or child selection of activities *always* produced a negative correlation.

A second way of putting engaged time to good use is placing students in a reading series at a point appropriate to their skill level. They should not use materials that are too easy, where they just review previously learned material. Nor should they use materials for which they lack essential preskills and, thus, make frequent mistakes.

Third, independent reading exercises must be instructionally appropriate. They should provide practice for new skills and for previously introduced skills that require continued practice.

Engaged time must be put to good use. First, if students are expected to learn to read, they must be engaged in reading-related activities. . . . A second way of putting engaged time to good use is placing students in a reading series at a point appropriate to their skill level. Third, independent reading exercises must be instructionally appropriate.

Classroom Orchestration

Orchestration occurs in two phases — at the beginning of the year and on a daily basis. Initial orchestration includes allocating instructional time, providing for the needs of remedial students, initial testing to determine group assignments and placement in the reading program, and ongoing evaluation to monitor student mastery. Day-to-day orchestration involves lesson planning, presentation, and follow-up.

Initial Orchestration

Allocating instructional time. A total reading program includes adequate provision for decoding, comprehension, study skills, recreational reading, writing, and spelling. The amount of time devoted to these activities should depend on the skill levels of the students. Teachers

working with students whose home environments provide a great deal of informal instruction in basic skills need not spend as much time on these skills as teachers working with students from homes in which informal instruction is limited. Students performing below grade level should spend more time on basic skills since they must acquire more than a year's worth of skills if they are to progress at a rate that will enable them to catch up to their peers.

Furthermore, the teacher must take responsibility for providing adequate time for reading. For example, if students are unlikely to read outside of school, yet their fluency indicates they need more reading practice, the teacher must provide extra time for practice. In the upper grades, a teacher might do this by incorporating reading activities into all content area instruction (mathematics, social studies, science, and so on) and by scheduling time into the day for recreational reading. Another method for increasing the amount of reading instruction is to train paraprofessionals and peer tutors to teach from scripted programs that specify instructional procedures in great detail.

Remedial reading instruction. Students unable to read books at their grade level are often pre-empted from success in school, since their limited reading ability handicaps their performance in nearly all other subject areas. Below-grade-level reading can result from a decoding deficit, a comprehension deficit, or a combination of the two. Regardless of the cause of the deficit, six guidelines are relevant to teaching remedial readers: provide extra instruction, start extra instruction as soon as any deficit appears, use additional personnel who are skilled in teaching reading, select a program that teaches essential skills and teaches them well, move remedial students through the instructional program as rapidly as possible, and motivate the students to achieve.

Initial testing. Tests given at the beginning of the school year should be designed to help teachers (1) place students of similar ability and knowledge in homogeneous groups, (2) have the groups begin with lessons appropriate for their ability and knowledge in the materials being used in the classroom, and (3) identify skills and/or information the students lack which might keep them from succeeding in reading. Carnine and Silbert (1979) recommend testing procedures that teachers at various grade levels, who are faced with testing 25 to 30 students, might use at the beginning of the year. Their procedures are designed to take relatively little time per student (5 to 10 minutes) and to be administered by a volunteer or teacher aide with minimal supervision.

Two basic types of tests are used to place students in reading instruction: norm-referenced tests and criterion-referenced tests. The major advantage of norm-referenced tests is that they allow for comparisons of different programs. Students from different programs can, with some precautions, be given the same test to determine if some programs seem to result in better student performance than other programs. But norm-referenced tests provide little information about how to instruct a student. That is, a percentile rank or grade equivalent score does not really indicate where to place a student in a commercial program or what a student's skill deficits are.

Criterion-referenced tests focus on specific skills, providing the teacher with information about what skills the student has and has not mastered. Criterion-referenced tests either focus on the skills from a commercial program (instruction-referenced test) or on important skills independent of any programs (objective-referenced test). We recommend two instruction-referenced tests and one objective-referenced test.

The first type of instruction-referenced test is an informal reading inventory (IRI), which is used to place students at their instructional level in a graded series of books, that is, at the level at which it would be appropriate to begin instruction. In general, an instructional level in a reading book is one at which a student can decode at about a 95 percent accuracy level and can comprehend the major theme of the material. The informal reading inventory is constructed by selecting sample passages from sequential levels of the reading series. Informal reading inventories should be used as the prime tool in placing students in basal reading programs.

A second type of instruction-referenced test is designed to test comprehension skills. Students should be grouped according to their ability to comprehend as well as their ability to

decode. For example, a student who can decode at a sixth-grade level but is unable to do comprehension exercises appropriate for that grade level may be placed, depending on the severity of the comprehension deficit, in a lower group. If placed in a higher group, the student should receive instruction geared toward specific deficits. Since the number of comprehension skills is much greater than the number of decoding skills, a beginning-of-the-year comprehension test can test only a small sample of the total number of skills. More thorough comprehension testing can be done during the school year.

One type of objective-referenced test focuses on various word attack skills. Diagnostic tests of work attack skills can be used (1) to help the teacher group beginning readers who do not know enough words to read a selection in an informal reading inventory and (2) to help the teacher identify specific deficits in word attack skills. Sample tests and directions for administering the tests on each reading level — beginning, primary, and intermediate — can be found in *Direct Instruction Reading* (Carnine and Silbert, 1979).

Ongoing evaluation. In addition to individual tests during a group instructional session, a teacher might set up a system to make periodic comprehensive checks on skills introduced to date. By regularly taking data on errors, reading rate, and exercises completed, teachers can keep close track of students' progress or lack of progress. Teachers need to know which students are performing well and which are performing poorly. Such information is critical in providing effective remediation and feedback to students. Often, graphs of student performance that show improvement motivate students to do better on their assignments.

Daily Orchestration

After students are grouped and placed in a commercial or teacher-made program, the teacher conducts individual reading lessons. The components of an ongoing implementation are planning, presentation, and follow-up.

Planning. The teacher must plan daily activities for the instructional session and for independent work. The plan must be realistic. Often, teacher guides from commercial programs suggest a variety of tasks that would take many hours to present or are too difficult. The teacher must decide which of these tasks are necessary and modify any that are too difficult. The teacher must also plan seatwork assignments appropriate for the amount of time available.

Presenting a lesson. A lesson consists of two major sections: (1) a teacher presentation and (2) passage reading and written exercises.

The teacher presentation usually involves decoding and comprehension activities (and possibly handwriting and spelling activities). For example, the decoding exercises during a second-grade lesson might include sound identification exercises, several introductory words that illustrate a new decoding skill, and a list of discrimination words that provide practice on the new skill and on skills introduced earlier which have been causing students difficulty. The exercises on identifying sounds and reading words prepare students not only for the passage and the written items for that lesson but also for upcoming lessons.

Comprehension activities during teacher presentation usually include instruction on critical words, that is, words that students probably do not know and that are inadequately explained in the passage; introduction of or practice on various strategies, such as how to draw inferences, how to paraphrase sentences with complex structures, how to summarize, and so on; and going over directions for independent seatwork assignments.

Students usually read passages and complete written exercises independently, unless the teacher is monitoring oral reading performance (which is often the case during the beginning and primary stages) or introducing a comprehension strategy that applies to an entire passage. For example, if the students are learning to paraphrase sentences with clauses or passive voice constructions, the teacher might ask them to paraphrase a sentence with a clause after they read it in the passage. When passage reading and written exercises are done independently, students should already have the decoding and comprehension skills needed to complete the assignment successfully.

Follow-up. Follow-up exercises are intended to deal with major problems that occur during passage reading or while the students are com-

pleting the written exercises. If students have decoding problems with a particular sound or word type, the teacher presents word lists or a passage that contains several examples of the troublesome skill during follow-up. If students have difficulty with a certain type of comprehension exercise, the teacher might review it with the students and then give them more practice on the same type of exercise, but with different items.

Administrative Involvement

Administrators are responsible for encouraging excellence in teaching where it occurs and fostering excellence where it is lacking. Excellence is fostered by attention to the five areas of teacher knowledge discussed earlier: scope and sequence, program design, presentation skills, engaged time, and classroom orchestration.

Principals should be familiar with the characteristics of programs that can work with all students, particularly educationally high-risk students. With this knowledge, principals can be meaningfully involved in material selection and discussions with teachers about the materials they are using with their students.

Administrators are responsible for encouraging excellence in teaching where it occurs and fostering excellence where it is lacking.

Principals must also be aware of the numerous teacher presentation techniques and monitor teachers' use of them. Teachers with a high level of skills should be acknowledged. Teachers with skill deficits should receive assistance through group inservice and through classroom observations and feedback. The most important monitoring activity focuses on student acquisition. Principals must be informed on a continuing basis of the level of mastery and amount of content covered for the students in each classroom. When achievement is at a low level on criterion-referenced tests or when progress is too slow, administrative action is needed to resolve the problem.

Allocated time is influenced by the degree to which principals encourage cross-room grouping (in which two or more teachers pool their students in order to form more homogeneous reading instruction groups), schedule the school day to maximize instruction and minimize interruptions, hire qualified paraprofessionals and provide training for them, assist in resolving discipline problems, and so on. Principals should also monitor classrooms, through brief visits, to insure that allocated time is being used for instruction.

Parent Involvement

Parents can contribute to student success in at least three ways: they can convey to their children the importance of schooling, they can provide for academic-engaged time at home (homework or leisure reading), and they can convey to the school their concern about the quality of instruction.

Parents should encourage children to read at home to show that reading is important in its own right (the example parents set is critical to their children's developing reading habits); they should require that their children complete their homework, thus conveying the importance that they place on schooling. In a single year, Follow Through students, who were taught by direct instruction, recorded over 30,000 hours in which they read to their parents or their parents read to them (Carnine, 1981). Parents can also ask their children to tell them what they learned in school and can cooperate with teachers in resolving specific problems.

Parents can demonstrate their concern about quality education by visiting schools and asking about the materials used to teach reading and the time devoted to reading instruction. They should ask to see specific measures of progress and, when progress is inadequate, they should ask what is being done to correct the situation. In addition to hearing about how reading is taught, parents should see reading being taught, observe how much time is spent on reading instruction, and note whether special help is provided to students with special needs.

Summary

The thesis of this paper is that direct instruction with a skills emphasis can significantly im-

prove students' reading achievement. However, improving schooling is neither simple nor easy. Teachers must be competent in designing or evaluating programs, in presenting reading lessons and activities, in providing academic-engaged time, and in orchestrating instruction. Teachers must also be familiar with a scope and sequence of reading instruction appropriate for the grade level they teach.

Teachers are not alone in their efforts. Administrators, parents, colleges of education, and publishers must share the responsibility for improving schooling.

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An Integration of Instructional Approaches for Teaching Reading and Learning from Text*

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Editors' Note: *Harry Singer describes one approach to integrating the reading instructional strategies described in the two preceding papers. He provides twelve assumptions which underlie his approach and then maps out in some detail approaches to reading instruction in four phases from three years to ten years. The phases are initial reading instruction, transition to formal reading instruction, formal reading instruction, and learning from text. Since most teachers use a basal reader in some way, Dr. Singer discusses the use of basal readers at some length.*

The curriculum sequence for teaching reading that appears in this paper represents the writer's thoughts on how to integrate reading instruction over time, selectively using different approaches, including those presented in the preceding two papers. It contains informal and transitional methods, the natural language method (experience charts or language experience approach) as a lead-in to a skill-based approach (basal reader), and recreational and enrichment (individualized, reference, or library) reading. It suggests provision for aspects of the language experience approach to continue by allocating instructional time for creative writing to a separate period from that in which spelling, grammar, and composition are taught. An overview of this instructional sequence appears in Figure 1.

This instructional sequence is based on the following twelve assumptions: (1) All students in the normal range of intelligence, which extends down to a level of IQ 55 to 65, the level at which pathology begins (Zigler, 1967), can learn to read, but they do so at different rates (Singer, 1977a). Hence, instruction in reading acquisition needs to be continuous, lasting for some students at least until grade 9. Provision should be made throughout the instructional sequence for individual differences in rates of learning to read. Under these conditions, the correlation between IQ and reading acquisition *decreases* as a group of students progresses through the grades (Singer, 1977a). (2) The teaching of reading should capitalize on a student's language background. (3) Instruction should progress from what a student knows to what a student needs to know, taught in small increments in order to maximize cumulative success in learning to read. (4) Meaning should be emphasized throughout instruction. (5) Systematic development of subskills is necessary and should be accomplished in a consistent, coherent, and

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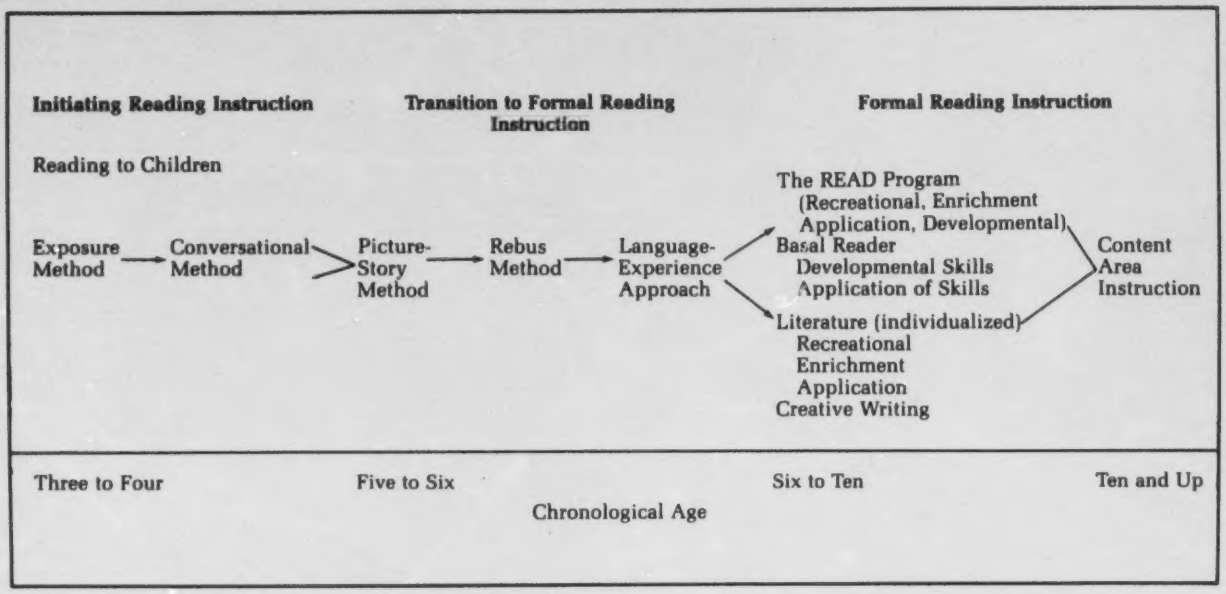

Figure 1. Time line for a sequence of reading instruction

cumulative manner (Singer, 1977c). (6) Students should learn a variety of ways of identifying printed words, including use of context, sound-symbol correspondences, structural analysis, and sight words, and these ways should be practiced in connected discourse (Singer, 1977b). (7) Instruction should be paced in such a way that students move toward independence in reading, greater self-confidence, and a growing feeling of mastery over printed materials. (8) Students should have opportunities to engage in recreational, enrichment, and application types of reading in addition to receiving developmental, skill-based reading instruction. (9) Students and teachers, as well as parents, need to be aware of students' progress toward mastery in learning to read and of how students compare with one another in their ability to learn from text (Singer, 1973). (10) Evaluation of a reading program should be based on the comprehensiveness of its scope, the appropriateness of its sequence of instruction, *and* the degree to which it helps students achieve in reading comprehension over the long haul (Ruddell, 1968). (11) While the correlation between IQ and *reading acquisition* decreases, the correlation between IQ and *ability to learn from text* increases as a group of students progresses through school (Singer, 1977a). Since children vary widely in their intellectual capacity and reading achievement, and since this range increases as students progress through the grades, it is necessary to provide a correspondingly wide range of instruction so that all students have an equal opportunity to learn. (12) Reading development should consist of two overlapping phases — learning how to read and using reading to learn from text (Singer and Donlan, 1980).

The initial phase of instructional emphasis in reading development is on teaching students how to read, that is, on teaching students to identify printed words, apply their language abilities and knowledge to anticipate words, integrate both of these components, and use this integration to construct meaning and comprehend printed materials.

When formal reading instruction begins at about age six, children in general have sophisticated control over syntax, a vocabulary of approximately 5,000 words, and pronunciation ability that is adequate for communicating their needs to their peers and to adults (Singer, 1973a). They also have acquired some knowledge of the world and have developed the ability to reason at a concrete stage of development. As they acquire the ability to respond to print *and* to integrate their language, knowledge, and reasoning abilities with responses to print, they learn to comprehend reading materials that are

within their experiential and conceptual level of development. Such integration does not occur until the third or fourth grade (Guthrie, 1973).

As students reach this mastery or criterion level of development in learning how to read, instruction gradually shifts to *the next phase of reading development, teaching students to comprehend or learn from texts in all content areas.* Learning from text involves development of the ability to interact with texts and construct meaning for them through (1) acquisition of technical terms, information, concepts, and generalizations; (2) development of knowledge structures; and (3) use of general reasoning abilities for inferring, interpreting, and evaluating printed materials. Thus, instruction in reading and learning from text shifts in emphasis from learning to read to learning from text but is continuous throughout the grades.

Initiating Reading Instruction

Although formal instruction can be initiated at the preschool level, most children start their reading instruction in an informal way, through their experiences with parents, peers, and television. The two informal methods described below often happen as a natural part of the child's interactions with parents, other adults, or older siblings.

Exposure method. The exposure method consists of parents reading stories to children at home or teachers reading stories to children at the preschool, nursery school, or kindergarten level (Durkin, 1962). Sitting next to the reader, children can begin to learn that print communicates meaning, is read in left to right order, and consists of words, sentences, and larger units. They also learn that stories have a structure, although at this stage of development, they perhaps learn only that a story has a beginning, middle, and end. They might also develop some sense that a story elicits not only thoughts but also affective reactions (Guthrie, 1978). Later they acquire a more differentiated structure: they understand that a story consists of a time, place, characters, plot, problem, and resolution (Rumelhart, 1977), or that a story has a problem, goal, and one or more attempts to solve the problem and reach the goal (Adams and Collins, 1977). By first grade, children already appear to have knowledge of story grammar (Mandler and Johnson, 1977). We know they have definitely achieved such knowledge prior to sixth grade (Dreher and Singer, 1980).

Conversational method. The conversational method is a slightly advanced version of the exposure method (Hildreth, 1960). At the child's initiation, the teacher or parent converses with the child about any aspect of the print, story, or book. At this time the child may also pick up some language of instruction: that letters make up words, words (groups of printed letters with white space on each side) make up sentences (a group of words that starts with a capital letter and ends with a period, question mark, or exclamation mark), and that sentences accumulate to tell a story (Downing, 1970). After hearing the same story read many times, some children can complete sentences by filling in the final word or phrase whenever the reader pauses toward the end of sentences, an ability which demonstrates not only memory at work but also, perhaps, contextual identification of words.

Transition to Formal Reading Instruction

Most children make a transition to formal reading instruction. They learn that print represents another way of communicating ideas that they have expressed in oral language. The transition starts with the picture-story method.

Picture-story method. In the picture-story method, a child draws a picture and then tells the teacher a story about the picture, frequently a single sentence, which the teacher prints under the story. The child begins to learn that the printing represents another way of communicating ideas that he or she has expressed in oral language. The child might accumulate these stories but is not expected to read them at this stage of reading development. This method, useful in kindergarten classes, is a precursor to the rebus and the language-experience method.

Rebus method. In the rebus method, the teacher reads the printed words in the sentence while the students read the pictured word. The method can use as few as 10 or 11 words, consisting of content words (I, you, me, and children's names), functional words for relating the content words to one another (to, for), two noun determiners (a, the), action-type verbs (go, see), and a stative verb (is). With this small group of words and pictured nouns on cards, the teacher

can construct an infinite number of sentences. For example, the teacher places three of the cards in a sequence, reads the words on them ("I see a . . ."), and then places a picture of a ball at the end of the sentence. The students say "ball." The teacher then turns over each card with a picture on it to reveal the corresponding printed word for the pictured object. Eventually, students will be able to identify the context words that have been used in this method, perhaps at first recognizing them as though they were ideographs but later beginning to build a sight word vocabulary. They can then use all their acquired words plus pictures to generate and read their own sentences (Singer and Beasley, 1970). Thus, the teacher can build up a repertoire of sight words that can be used in the experience-chart method or the language-experience approach. (For more detail on the rebus method, see Woodcock, 1967.)

The experience-chart method or the language-experience approach. The experience-chart method, first devised in the 1920s (Smith, 1965) was expanded in the 1960s into a complete reading program known as the language-experience approach. The technique begins with children having a common experience and subsequently relating what has happened to the teacher. The teacher writes the children's story on the blackboard — sometimes editing it — and then has the children read it. They first read their own sentences, then other sentences, and finally the whole story. The teacher then uses the story in a variety of ways; by having children pick out identical words and sounds, for example, the teacher will teach them some sight words and some symbol-sound correspondences. Eventually, students will be able to dictate and even write their own stories. The language-experience approach can continue on into the primary grades, merging with creative writing and with instruction in grammar and spelling (Lee and Van Allen, 1963).

Formal Reading Instruction

After students have acquired some sight words, the teacher can shift to a basal reader or to individualized instruction, or both.

Basal readers. The advantage of the basal reader is that the teacher can use this tool to provide systematic instruction in the subskills underlying reading comprehension, furnish practice for these skills in a meaningful context, and economize on teacher time.

The construction of a comprehensive scope and sequence of subskills for developing reading in grades one through six is almost impossible considering the already tight schedules that daily confront teachers. Basal readers are designed to provide such a scope and sequence.

The advantage of the basal reader is that the teacher can use this tool to provide systematic instruction in the subskills underlying reading comprehension, furnish practice for these skills in a meaningful context, and economize on teacher time.

Use of basal readers assists teachers in developing a number of subskills in their students, including symbol-sound correspondence, dividing words into their components and then using symbol-sound correspondence to identify the words (shep-herd), syntactic relationships, and acquisition of sight words. With practice, these skills will eventually become automatic, enabling students to concentrate on comprehension (LaBerge and Samuels, 1976).

If teachers had to locate materials for developing these skills or for providing practice in using these skills in connected discourse, this search would be an uneconomical use of teacher time. Hence, it is not surprising to find that teachers are using basal readers as much now as they did prior to the explosion of methods and materials in the 1960s.

A basal reader may use a general process to teach any aspect of print-to-sound correspondence, such as identification of initial and final consonants, vowels, syllables, and morphemes (minimal meaning units, such as prefixes, suffixes, and roots). The process consists of grouping familiar words that have a common grapheme component (*hat*, *bat*, *mat*), then teaching students to abstract and generalize both the grapheme component (/at/) and the print-to-sound correspondence by having stu-

dents volunteer words that contain examples of these relationships, and, finally, letting students practice this word identification process while reading connected discourse.

The transfer of word identification and word meaning processes to the reading of connected discourse will tend to integrate these processes with the use of context clues (McCullough, 1972). [A more direct way of teaching context clues is through a deletion process in which the word or word part is omitted; the cloze technique, in which every fifth or tenth word is omitted, is an example (Taylor, 1953). This technique requires that students rely on the syntax and semantics of the sentence in order to infer the missing word or word part.] Students will learn to be versatile in identifying printed words, including using clues in words and context, and they will learn to mobilize their responses to printed words in various ways according to the demands of the task and their purposes in reading (Singer, 1977b).

Students can progress through basal readers at their own pace, but presumably enough students will be in the same basal reader at the same time that they can be grouped for directed reading instruction.

Directed reading instruction is used in most basal readers. The lesson for a story includes the new vocabulary, development of background information assumed by the basal reader story to be part of the students' knowledge of the world (Winograd, 1972), and establishment of purposes and a perspective for reading the story (Pichert and Anderson, 1976). In most lessons, the teacher reads the introductory part of the story, offers guidance to students by asking them questions to stimulate their reading, has the students read the remainder of the story silently, calls upon them to answer teacher-posed questions that are listed on the blackboard or provided by the teacher after the students have read the story, and, finally, leads a discussion of the story and the students' answers to the questions.

Basal readers assume that reading comprehension is an interactive process in which (1) text stimulates the reader to construct responses by drawing on systems at the letter (literal), word (lexical), word order (syntactic), meaning (semantic), knowledge, inferential, interpretive, and evaluative levels and (2) exposure to these systems in turn causes the reader to develop expectations about the systems themselves and about the text. It is the responsibility of the teacher to develop these systems within the reader and teach the reader to use them as an interactive process (Adams and Collins, 1977).

Directed reading instruction has been described here as it typically occurs in the classroom. Some changes do need to take place, however. The teacher initially should model the kinds of questions to be asked about the type of materials being read, but the goal should be to *teach students to formulate their own questions and search for answers as they read.* To achieve this goal, the teacher should gradually phase out teacher-posed questions and shift to student-formulated questions (Singer, 1979). For example, after the teacher has posed some questions and aroused curiosity about a particular story, the students can be asked, "What would you like to know next about the story?" This teacher-posed question is likely to get a student-formulated question in return. As students learn to ask their own questions, the number of teacher-posed questions can be reduced; eventually, only student-formulated questions will be used. The students will, over time, learn to satisfy their own purposes in reading and will acquire the process of active comprehension, a continuous process of asking and searching for answers to self-posed questions.

Knowledge of progress. When students have learned to read, they can give up the basal reader. Differentiated testing should be used to determine whether students have reached this level of reading development. The purpose of this type of testing is to separate progress in learning to read from ability to learn from text.

Progress in learning to read. For assessing reading acquisition after each level of instruction, say at the end of each semester in the primary grades, use the same test, such as a paragraph comprehension test standardized on a sample of children in grade one. Administer this test repeatedly until children demonstrate mastery over learning to read. Mastery can be defined as attainment of a score on the test that

is equivalent to the 85th-95th percentile. Students who have reached this criterion have learned (1) appropriate responses to printed words such as symbol-sound correspondence, structural analysis, and blending of sounds to produce whole words; (2) the ability to apply their knowledge, reasoning, and language abilities, such as their knowledge of syntax and semantics, to anticipate printed words in sentences; and (3) the ability to integrate the first two skills to identify printed words, to select contextually determined meanings for them, and to comprehend text at a relatively easy level.

While students are learning to read, they are also using their reading ability to learn from text. After they have attained mastery in the initial phase of learning to read, they continue their reading development as they shift to using reading for learning how to learn from texts in all content areas.

Ability to learn from text. To assess a student's ability to learn from text and to obtain a score that will provide information on how that student's reading achievement compares with his or her peer group on a national level, use a standardized test that is norm-referenced for the student's grade level (Singer, 1973b). The differentiated results from both types of testing are shown in Figure 2.

However, students need more frequent knowledge of progress to motivate their learning. For this purpose, we recommend "cumulative progress charts" (Singer and Beasley, 1970). An example of a cumulative progress chart for sight word recognition is shown in Figure 3.

The chart in Figure 3 indicates that a student learned ten words in the first session, no additional words in the second session, another ten words in the third session, and five more words by the end of the fifth session. Since words learned are added cumulatively, the graphed line either goes up or remains at the same level; it cannot go down.

If students use the words they have learned, they will remember them. Students can use their words in various reading activities or in "sentence generators." For example, students can substitute their words which have been color-coded for parts of speech in the appropriate slots of, say, a *Noun-Verb-Adjective* sentence generator to produce such a sentence as "Candy is sweet." The other basic sentence generators are *Noun-Verb-Noun determiner-Noun* (He hit the ball.); *Noun-Verb-Noun-Noun determiner-Noun* (He gave Mary a gift.); and *Noun-Verb-Noun determiner-Noun* (She is a girl.). Through the use of these four basic sentence generators, students can use their words to produce any number of sentences (Singer and Beasley, 1970; Singer, 1979).

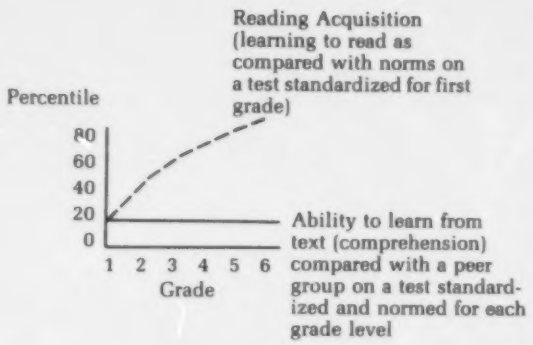
Reading Acquisition (learning to read as compared with norms on a test standardized for first grade)
Percentile
80
60
40
20
0
1 2 3 4 5 6
Grade
Ability to learn from text (comprehension) compared with a peer group on a test standardized and normed for each grade level

Figure 2. Hypothetical results for a particular student showing student's development in reading acquisition and ability to interact with text. The Reading Acquisition or learning to read curve was constructed by administering the same test standardized and normed at the first-grade level to the same student at the end of grades 1, 2, 3, and 4. The curve for ability to learn from text was based on *different* tests, each standardized and normed for successive grade levels. In this figure, the student's rate of learning from text is the *same* relative to his or her peer group. If the student's rate *increased* relative to his or her peer group, the solid line would go up; if it *decreased*, the solid line would go down.

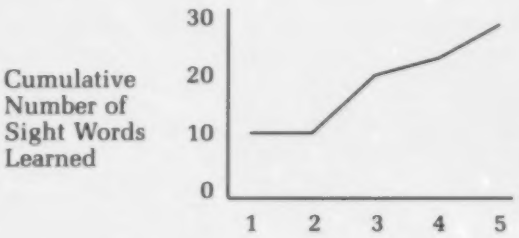

Figure 3. Cumulative number of sight words learned over five sessions

Similar charts can also be constructed for other objectives in the instructional program, such as cumulative acquisition of symbol-sound correspondences, knowledge of prefixes, suffixes, and roots, or number of pages read either from a basal reader or in a book selected during individualized reading instruction. Students will be able to watch their progress on their word charts, and they will also begin to see a cause-and-effect relationship between their effort and their achievement.

Individualized reading instruction. A program in individualized reading instruction is based upon a classroom library of children's literature and upon individual conference periods between teacher and students to discuss the students' selection of books and ways of learning to read from them (Veatch, 1954). Students can also use the classroom library for recreational reading.

A disadvantage of individualized reading instruction is that when a 240-minute teaching day is divided among 30 students, teachers have only 8 minutes per day per child for instruction! Hence, teachers cannot give any student much individual attention. To economize on time and to maximize the effect of instruction, teachers need to group students for instruction. Since students are not homogeneous in reading achievement or in the subskills underlying their achievement (Balow, 1962), teachers have to group and regroup students for instruction that students specifically need. The grouping should be determined by test results and teacher observations of students' performance during instruction.

Another disadvantage of the individualized reading program is that teachers are likely to be less than systematic in developing subskills necessary for learning to read. A possible solution is to use a combination of a basal reading program three or four days a week and an individualized reading program the other one or two days.

Of course, it is also possible to teach reading two periods per day. Then the basal reader and individualized reading instruction can each be used daily. For example, an elementary school in Las Vegas, Nevada, teaches a basal program in the morning and individualized or reference reading in the afternoon. In this school, all the students read at grade level or above as shown by a standardized achievement test. The lowest achiever in each grade reads at least at grade level or above. There is still a range of individual differences in reading achievement at each grade level, but the range extends upward from the grade level (Singer, 1977c).

The range of individual differences in reading achievement increases from a four-year range in grade 1 to a twelve-year span in grade 12 (Goodlad, 1966). Hence, teachers who are committed to the principle of providing equality of educational opportunity for all students can do so by adopting strategies, detailed in the next section, that will enable them to teach all students academic content without stigmatizing any student (Singer and Donlan, 1980). These strategies, combined with teachers' knowledge of their content areas, will enable students to go beyond the acquisition phase of reading development to the next phase, learning from text.

Learning from Text Phase of Reading Instruction

In teaching students to learn from text, teachers can use single- and multiple-text strategies. Single-text strategies consist of

1. The directed reading activity with active comprehension, which was decribed in the discussion of the basal reader;
2. Marginal glosses that contain explanatory notes;
3. Reading and learning from text guides which emphasize instruction in acquisition and levels of comprehension — informational, interpretive, generalized, evaluative, and applied; and
4. The SQ3R study method (survey, question, read, recite, and review).

Multiple-text strategies include

1. The concept technique, which consists of texts on various levels of difficulty but all related to the same concept;
2. Inquiry, which requires that students use a library to answer a particular question arising from study of texts in a content area; and

3. The project method, in which students pursue answers to their own questions about a particular content area unit.

For a more detailed explanation of these strategies for teaching students to read and learn from texts in the content areas, see the text by Singer and Donlan (1980). Other books for teaching students to learn from texts in the content areas are by Burmeister (1974) and Shepherd (1978).

Conclusion

An integration of instructional approaches for teaching reading and learning from text is necessary to satisfy all the assumptions we posed at the beginning of this position statement. Instead of championing a particular method which may emphasize students' language abilities and background knowledge as the language-experience approach does or a method which stresses learning of responses to printed words as coding emphasis programs do, the integrated approach draws upon both methods because each contributes a necessary component to reading acquisition.

The integrated approach also tries to cover all types of reading, such as recreational, enrichment, applied, as well as the developmental skills which occur in basal readers. We use the acronym READ to remember these four components. Recreational, enrichment, and applied types of reading represent the goals of the reading program. If we were teaching swimming, they would be the swimming pools for our program. The acquisition and developmental skills are the means to these goals. But the goals do not come at the end of the program. They start the program with parents or teachers reading to children in the exposure and conversational methods, and they occur at the end of each skill lesson. We want students to practice the skills in reading books for pleasure, to solve problems, and to extend their knowledge.

The integrated approach does not stop with elementary instruction but continues on to high school. At this level students must learn how to read and learn from texts in mathematics, science, literature, and social sciences, such as history, geography, government, and so on. Elementary instruction can only begin to prepare students for this advanced level of instruction. To teach them how to learn from text, teachers need to use single- and multiple-text strategies. These strategies will also help teachers handle the wide range of individual differences in reading achievement found in each classroom. Thus, the integrated approach uses a multiplicity of methods to provide equality of educational opportunity and help each student develop ability to read and learn from text.

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Learning to Learn from Text: A Framework for Improving Classroom Practice*

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Editors' Note: *Recent research on comprehension emphasizes that the student's prior knowledge influences what he or she understands and remembers in reading or listening. The theory behind much of this research is referred to as schema theory — schema being the structures in which people organize knowledge in their minds. After reviewing research related to schema theory and comprehension, Robert Tierney and David Pearson explore some of the implications of the research for practice. They examine schema-related factors which influence readability of text and provide more specific guidance for helping students who are having trouble with comprehension. Many experts in reading believe that the research related to comprehension will have a major influence on how reading is taught in the next ten years. These are ideas educators need to be thinking about, recognizing that much is yet to be learned about their implications for practice.*

We believe that if teachers understand the nature of reading comprehension and learning from text, they will have the basis for evaluating and improving learning environments. During the past decade many advances have been made in the psychology and pedagogy of reading comprehension that provide exciting possibilities for changing our approaches to helping students learn how to learn from text. For example, research findings suggest that less reliance should be placed on traditional readability procedures involved in text selection and use, and more credence given to teachers' impressionistic determinations of the extent to which a text fits with and might be used by selected students.

Other research evidence suggests that teachers must recognize that a reader has a right to an interpretation and that reading comprehension is an interactive process involving more than a regurgitation of an author's explicit ideas. Readers should be encouraged to actively engage their background knowledge prior to, during, and after reading. They should be given opportunities to appreciate and evaluate the adequacy of their own perspective and other interpretations, to monitor their own progress through a text, and to discriminate new learnings from old knowledge.

Curriculum objectives should address the importance, nature, and influence of a reader's background knowledge; the need for a variable balance between reader-based and text-based processing; and the importance of selected monitoring strategies which students can manage independently. Widely practiced notions

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that compartmentalize comprehension into simple question types on a continuum from literal to inferred to evaluative should be rethought. Teaching prescriptions for how to process a text which disregard the ever changing interplay of text, purpose, and reader should be discarded. In their stead, we advocate the adoption of teaching procedures that encourage students to monitor their own processing strategies: how they allocate attention to text versus prior knowledge, how they can tell *what* and *that* they know, and how to apply fix-up strategies when comprehension is difficult.

In this paper, we will discuss each of the preceding notions about reading comprehension and classroom practice and suggest their implications for teaching. Our suggestions to teachers are not intended to be exhaustive, exemplary, or very specific. Instead, they are intended to provide teachers with guidelines and examples of ways they might proceed to develop their own teaching procedures.

Some Basic Notions about Reading Comprehension and Learning

Consider for a moment what is involved in comprehending the following passage:

The Dust Bowl

> During World War I, prices had tempted farmers to grow wheat and cotton in the former grazing lands of the Plains region. Plows and harrows broke up the deep, tough sod that had previously prevented erosion and conserved moisture in this semi-arid region. When the years 1933–1935 proved unusually dry, there was danger that the region would become a desert. Terrible dust storms carried away topsoil in such quantities that even on the Atlantic seaboard the sun was obscured by a yellow haze. The water table of parts of the Plains region sank so low that wells ran dry. Between 1934 and 1939 an estimated 350,000 farmers emigrated from the "dust bowl." To take care of immediate distress, Congress provided funds so that dust bowl farmers could get new seed and livestock. On a long-term basis, the Department of Agriculture dealt with the dust bowl by helping farmers to plant 190 million trees in shelter beds, which cut wind velocity and retained moisture. Farmers were also encouraged to restore the Plains to what they had been in the days of the cattle kingdom and earlier — a grazing region. (Bragdon and McCutchan, 1976, p. 625)

Readers familiar with farming and the Plains area of the United States will likely recognize how the drought, forces of supply and demand, and soil changes interacted to contribute to deteriorating conditions during the Dust Bowl era. They might be able to visualize the changing conditions of the topography and sense the frustration and anguish experienced by the farmers. Readers unfamiliar with farming but possessing firsthand experience with economic hardships might focus on the personal hardships and family upheaval associated with periods of depression. Readers who have experienced both farm life and economic hardship might even be able to go beyond visualizing the drought conditions to experiencing a dryness in their mouth or a lump in their throat as their interpretation of the text triggers recall of specific experiences from their past.

The point of this example is that comprehension never occurs in a vacuum. It cannot proceed independently of all of the related experiences that make up the reader's background knowledge, or schemata (schema: singular), to use the recently rediscovered terminology of cognitive scientists. There have been literally dozens of experimental demonstrations of the role that differences in background knowledge play in determining how students understand and retrieve information encountered in texts. Yet current teaching and assessment procedures, with their emphasis on correct answers and preferred interpretations, seem to operate on the assumption that comprehension occurs independent of individual differences in background knowledge (a point to which we will return later in more detail).

How does comprehension proceed? If comprehension is not simply a matter of mapping the author's message into a reader's memory, how then does it occur? Let us begin with an example, taken from Collins, Brown, and Larkin (1977):

Window Text

> He plunked down $5.00 at the window. She tried to give him $2.50, but he refused to take it. So when they got inside, she bought him a large bag of popcorn. (p. 3)

With the initial statement, "He plunked down $5.00 at the window," the readers begin a search

to build a model of the meaning of the text. One reader may invoke a racetrack scenario as a model; a second, a bank; a third, a movie theater. Each of these scenarios or models may be thought of as different schemata that different readers would invoke because of different levels of experience they have had with such scenarios in the past. Once evoked, each schema provides a framework for continuing the search to build a model for what the text means. For example, the racetrack schema creates expectations that bets, odds, horses, or jockeys will be mentioned soon, whereas the movie theater schema creates expectations that might include a film title, popcorn, previews, or a movie star's name.

Cognitive scientists like David Rumelhart (1977; 1981) say that schemata have certain *slots* that must be filled and that comprehension consists of recognizing specific items in a text that fill those slots. For example, "he" in the first sentence is a candidate for the "bettor" slot in a racetrack schema, the "depositor" slot in a bank schema, or the "moviegoer" slot in the movie theater scenario. As depicted in Figure 1, they may have constructed an initial model of the text involving, for example, a bank window with some bound slots (concepts enclosed by boxes) and some slots awaiting binding (concepts enclosed by circles). As readers proceed, they progressively refine their models. In this example, "she" is usually defined as the recipient of the money; "$2.50" is usually identified as change. Then with the statement, "So when they got inside, she bought him a large bag of popcorn," readers who have not envisioned a movie theater usually recognize a conflict. They realize their models no longer match the text and are implausible, disconnected, and incomplete. To restructure their model, they might question previous interpretations (for example, that the female was a bank clerk or a bet taker) and shift to a different schema — from a bank or racetrack to a theater. Eventually, it is likely that the readers will build a model that involves the

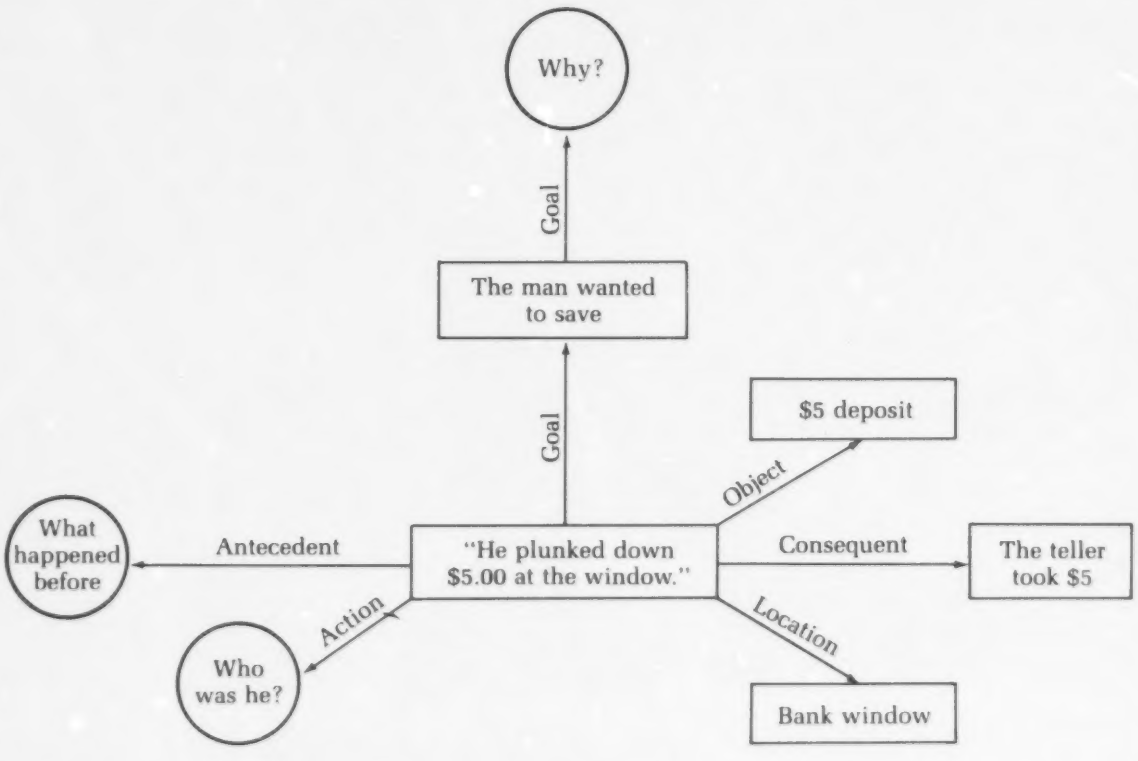

Figure 1. An initial stage in the construction of a model or scenario for the "Window Text."

purchase of two tickets and an attempt by a date to share the expenses. At this point, readers will sense that they have accounted for the text and that their interpretations make sense and are complete.

These same notions of reading comprehension can be applied to the passage, "The Dust Bowl." With the initial statement, "During World War I, prices had tempted farmers to grow wheat and cotton in the former grazing lands of the Plains region," readers will likely activate their knowledge of farming and constrain these ideas in terms of the time period (World War I) and the type of farming to which the author alluded (wheat and cotton). As readers proceed, they are expected to relate these changes in farming — now focused on wheat and cotton — to plowing and the effects of plowing upon the conservation of moisture and the potential for soil erosion. Across the next several sentences, "When the years ... terrible dust storms ... wells ran dry," readers need to activate other background knowledge, maintain their focus, and progressively refine a model for the text. Assuming a singular purpose and adequate background knowledge, it is likely that readers will eventually develop a model for the text which involves an appreciation of the events causing the dust bowl crisis and what Congress did to alleviate the problem. Readers will then either tacitly or consciously consider the adequacy of their interpretation, in particular, the extent to which (1) their purposes for reading the text have been met and accounted for in relation to the text, and sometimes (2) the relevance or transfer value of their acquired understanding.

A key point of schema theory, then, is that reading comprehension proceeds and inferencing occurs via the progressive refinement of the reader's model. Collins, Brown, and Larkin (1977) describe this refinement process:

> The initial model is a partial model, constructed from schemas triggered by the beginning elements of the text. The models are progressively refined by trying to fill the unspecified slots in each model as it is constructed ... and the search for relevant information is constrained more and more. (pp. 4-5)

Within this framework, the reader's schemata will be involved in the progressive construction of a scenario which is complete, interconnected, and plausible — which will account for the elements and relationships within the text and the world as the reader sees it. If the reader's model seems tenable, then the schemata that comprise the model will be involved in further text processing. If at any point the reader's model seems untenable, then schemata will drive the reexamination, reconstruction, or restructuring of elements in the text to build a new model.

To summarize, the following statements can be made about reading comprehension: (1) a reader's background knowledge and purposes have an overriding influence on the reader's development of meaning, and (2) reading comprehension involves the activation, focusing, maintaining, and refining of ideas toward developing interpretations (models) which are plausible, interconnected, and complete. In addition, there is a sense in which the reader's comprehension involves two other facets: the reader's *knowing* (either tacitly or consciously) that an interpretation for a text is plausible, interconnected, and complete and, ideally, the reader's evaluation of the transfer value of any acquired understandings.

Implications for Classroom Practice

Recent examinations of instructional practices suggest that there are not many effective practices for developing or improving comprehension in schools (Durkin, 1978-79; Tierney, LaZansky, and Schallert, 1981). In most lessons, students are given passages to read. While the students are reading the passages or after they have finished, teachers assess their comprehension informally by asking them questions and having them respond either orally or on worksheets. The responses, if discussed at all, focus on finding a right answer. In terms of skill acquisition, a high premium has been placed upon separated curriculum objectives unrelated to any comprehensive model of reading comprehension or learning. These objectives are clustered around arbitrarily defined skill categories (for example, literal, inferential, and evaluative comprehension) which give little attention to the role of a reader's background knowledge and the importance of improving a reader's ability to learn how to learn.

Reading comprehension is an area of the curriculum where there has been little progress. Moreover, the changes which have occurred have not been tied to a careful analysis of the nature of reading comprehension and learning. We suggest that if teachers understand the nature of reading comprehension and learning then they will have the basis for determining what might facilitate — and what might impede — the development of comprehension and learning. We believe that a schema-theoretic perspective offers such a basis. Accordingly we suggest the following questions as guidelines for implementing curriculum improvements. Our guidelines are tied to three traditional and interrelated segments in typical lessons for reading selections: preparing for reading, guiding reader-text interaction, and postreading comprehension and learning.

Prerequisite for Reading: Does the reader have schemata relevant for understanding a text?

Our first guideline is concerned with whether a match or a mismatch exists between the purposes and prior knowledge of readers *and* the intentions and expectations of authors. That is, does the reader have the relevant schemata for a text?

Consider first the issue of match between an *author's intentions and a reader's purposes.* In our reviews of textbook materials we have encountered numerous examples where text intended for one purpose is forced to fit other purposes. With little regard for the integrity of a selection, some publishers seem to presume text well written for one purpose will be appropriate and well written for other purposes. For example, in a certain biology textbook, which will go unnamed, the publisher uses a text describing the changing color of leaves to try to explain the physical process of these changes. The questions which are asked following the selection assume the readers have been given many more details than the text provides; further, they totally disregard the descriptive-aesthetic functions the text appears to serve. In the elementary classroom, simple narratives usually intended to be read for enjoyment are often sabotaged by an excessive use of poorly fitting questions (such as detail questions dealing with trivial information) under the guise of skill objectives.

Before using a text for instructional purposes, a teacher should consider the functions the text is intended to serve and balance those against the teacher's intentions in using the text and the students' purposes in reading it. For example, text might be examined by first isolating the essential understandings students are expected to derive from the text and then examining the extent and nature of support (usually in the form of concrete examples and analogies that can bind new learnings to old) for these understandings provided within the text. If the reader's purposes are quite unlike those intended by the author, and if the text cannot be augmented *even with teacher support* (that is, the teacher provides the analogues and examples), then it should not be read to elicit those assumed understandings.

Before using a text for instructional purposes, a teacher should consider the functions the text is intended to serve and balance those against the teacher's intentions in using the text and the student's purposes in reading it.

Compare the obvious differences between the understandings readers might be expected to glean from Stephen Crane's *The Red Badge of Courage*, which uses the American Civil War as background, and a chapter called "The Civil War" in a history textbook. In the former, the themes of death, fear, and cowardice evoked by the experiences of a young man participating in war are likely to capture the reader. In the latter, the facts and concepts that describe and define the Civil War will be paramount. It might be reasonable to expect a reader of Crane's work to glean an appreciation of how it must feel to be caught up in a war; for the textbook chapter, it might be reasonable to expect the reader to develop an appreciation of the causes, progress, and consequences of the Civil War. Even with a great deal of teacher support, neither text could serve the purposes for which the other text seems intended.

Consider second the issue of mismatch between an *author's expectations regarding*

audience and a reader's prior background of experience. There are many times when a text written for an audience with certain background knowledge is given to an audience with different or limited knowledge of the topic. For example, an American reader would have difficulty trying to understand the following passage, even if it were revised to a lower readability level.

Today's Cricket

The batsmen were merciless against the bowlers. The bowlers placed their men in slips and covers. But to no avail. The batsmen hit one four after another along with an occasional six. Not once did a ball look like it would hit their stumps or be caught.

Revised Version

The men were at bat against the bowlers. They did not show any pity. The bowlers placed their men in slips. They placed their men in covers. It did not help. The batsmen hit a lot of fours. They hit some sixes. No ball hit the stumps. No ball was caught.

Or consider the following segment taken from a biology text (Gallant, 1975):

The Garbage Collectors of the Sea

The garbage collectors of the sea are the decomposers. Day and night, ocean plants and animals that die, and the body wastes of living animals, slowly drift down to the sea floor. There is a steady rain of such material that builds up on the sea bottom. This is especially true on the continental shelves, where life is rich. It is less true in the desert regions of the deep ocean.

As on the land, different kinds of bacteria also live in the sea. They attack the remains of dead plant and animals tissue and break it down into nutrients. These nutrients are then taken up by plant and animals plankton alike. Among such nutrients are nitrate, phosphate, manganese, silica, and calcium . . . . (p. 395)

It does not take too much effort to identify the readers for whom these texts, even if adapted for readability, might be inappropriate or incomprehensible. The first passage is written for an audience knowledgeable about cricket; the second passage is intended for an American high school student with an understanding of decomposition, continental shelves, body wastes, and bacteria. Without these understandings, we would predict that readers will have a great deal of difficulty reading the text and will likely develop incomplete or inappropriate interpretations for the text.

How can teachers assess whether a mismatch is likely to occur? It is our argument that traditional readability procedures (the use of a formula based upon word difficulty, word length, and sentence length or the use of the cloze procedure requiring the replacement of deleted words) will not suffice. Instead teachers should judge the adequacy of text for themselves. They should pursue an impressionistic evaluation of the demands of the text in conjunction with an assessment of readers' prior knowledge. An analysis of "The Garbage Collectors of the Sea," for example, could involve an examination of the support given the concept of decomposition and an informal assessment of what students know. "Day and night" and "steady rain" provide ample support for the notion that *decomposition* is a never-ending process, but the reference to *continental shelves* — a term likely to be unfamiliar to most readers — and those aspects of the text which specify what *decomposers* are can be considered vague. To verify the possibility of a mismatch, teachers might informally assess the students' background knowledge by discussing with students what they know about these key concepts prior to reading.

If mismatches are inevitable, teachers have two choices — they can dismiss the passage as inadequate, or they can provide the students with the background experiences appropriate to the text. If they choose the latter course, teachers can support the use of the passage with other reading material, media, activities, and experiences to supplement what students already know. Rumelhart and Ortony (1977) have emphasized that "in all cases existing knowledge is utilized and required for the acquisition of new knowledge" (p. 117). Similarly, Pearson and Spiro (1981) suggest that "instead of asking the question 'what *does* the student *not know* that I have to help him or her learn?' educators should be asking 'what is it that the student *does know* that I can use as an anchor point — a bridge — to help develop the concepts that he or she needs?' " This implies that in those situations for which the students lack background knowledge, teachers need to build

bridges from what they already know or provide experiences or analogies (for example, a discussion of baseball as a means of understanding cricket) by which the students can build such bridges for themselves.

Apart from specific action, teachers might offer a general program of schema development. Such a program might include field trips as well as films in conjunction with topics being read or discussed. It might involve students in activities which encourage their pursuit of or immersion in a topic through a variety of resources, for example, library materials and discussions with knowledgeable persons.

Guiding Reader-Text Interactions: Do readers engage their schemata?

Our second guideline moves our discussion of pedagogy from prerequisites for dealing with text to the issue of student engagement with text. This guideline assumes that readers already have adequate prior knowledge for dealing with text and asks whether they engage it. Many theorists and practitioners advocate strategies which are derived either directly or indirectly from these notions. For example, most basal reading lessons and many reading educators advise teachers to begin with either selected questions or a discussion of a story topic designed to activate background knowledge prior to reading. During reading, they often insert questions as a means of guiding or shaping a reader's understanding.

Schema engagement relates to (1) the reader's initial contact with a text, (2) the reader's ability to relate his or her own background of experience to the information represented within the text, and (3) the reader's ability to focus and refine his or her understanding of the text material. Important questions for the teacher to ask are

> Was the reader's schema engaged prior to reading, during reading, and after reading?
>
> To what extent did learning occur? Was the reader's relevant background of experience focused and structured during reading?

Schema engagement in some students can be a serious problem for teachers. A teacher may assume correctly that students have appropriate schemata for reading a text, only to discover in a postreading discussion that they did not engage those schemata while reading. Sometimes this problem manifests itself as a general lack of interest in reading a text or as an unwillingness to consider a topic or purposes prior to reading. Sometimes a schema engagement problem may be passage specific — that is, it may arise for certain texts and not for others. Sometimes readers fail to maintain schemata while reading.

. . . in those situations for which the students lack background knowledge, teachers need to build bridges from what the students already know or provide experiences or analogies . . . by which they can build such bridges for themselves.

This may occur for a number of different reasons. First, readers may be predisposed to plod laboriously through any and every text they read. For example, readers may be devoting all their attention and capacity to decoding, leaving no room for comprehension. Second, poorly written text — sudden shifts in topics, inadequate transitions, or poorly developed ideas — may make schema maintenance difficult, if not impossible. Third, readers may be inattentive or distracted by too many or ill-considered adjuncts; that is, sometimes study questions and activities interrupt reading and cause a disruption of schema engagement.

What can teachers do? First and foremost, teachers should remain alert to whether students are engaging their schemata prior to, during, and after reading. Typically, a few well-placed and open-ended questions will generate a response from students which can help the teacher make such an assessment. If schema engagement problems are apparent, then teachers can adopt and adapt teaching procedures to meet the specific needs of readers. Since it is not likely that a single procedure will be appropriate for all students in all situations, and it is possible that teacher adjuncts may do more harm than good, the following broad suggestions are presented only as examples:

Source of Problem	Some Possible Solutions
General reader inertia, lack of interest	Use highly motivational material and functional reading material which necessitates a student response (for example, following directions).
	Use adjuncts (inserted questions and study guide activities) which relate what the students are reading to what they know and might do.
Passage-specific problems	Alert students as to what successful readers do to cope with text. Encourage the application of strategies across a variety of text situations (for example, have students relate what they do in successful situations with what they do in nonsuccessful situations).
Lack of focus and an inability to structure information	Have students develop "maps" or diagrammatic representations of the text (for example, outlines or flow charts).
	Provide adjuncts which encourage readers to focus and structure their ideas.
	Encourage students to use heuristics (who, what, when, where, why).
	Encourage note taking and outlining.
Lack of focus caused by laborious processing tendencies	Use texts which require or encourage greater student response.
	Encourage multiple passes through a text (skimming for the gist, rereading more carefully to check the relationship between key points).
	Highlight "reading for meaning."
Text-based problems (discontinuity, poorly developed ideas, and so on)	Prepare adjuncts to circumvent the difficulties (e.g., include statements which clarify the ideas represented in the text or encourage students to skip over them).
	Encourage students to be the critics of poorly written text (for example, have students evaluate poorly developed text and discuss how an author or reader might address these problems).
Overdependency upon teacher support	Avoid the use of any adjuncts which will displace the text.
	Use adjuncts sparingly and in conjunction with encouraging the reader to be self-initiating.
	Have students replace teacher adjuncts with their own probes.
	Discuss the purpose and role of any adjuncts used.

Guiding Reader-Text Interactions: Does the reader exhibit flexible processing across different texts read for different purposes?

Our third guideline, tied directly to our second guideline, addresses the issue of monitoring reader-text interactions. As suggested earlier, with reference to Figure 1, when readers interact with text they will and should acquire some information that was represented in the text and integrate it with information from their background knowledge. Certainly, there are situations for which it may be reasonable to expect a reader's understanding to remain close to the text — for example, when following a set of directions. But there are other situations for which it may be appropriate to expect a more reader-based interpretation.

Consider the situation in which a reader's interpretation of the passage below is too reader based, producing understandings that are "too loose" for the text and its intended purpose. What might be the ramifications if a science student read the text too loosely?

> The experiment that you are about to do deals with a property of light. For this experiment you'll need a penny, a cup, transparent tape and a pitcher of water.
>
> To perform the experiment, tape the penny to the bottom of the cup. Move your head to a point just beyond where you can see the penny.
>
> Hold your head still, then slowly pour water into the cup. Be sure not to move your head.
>
> Stop pouring if the penny comes into view. (Tierney and LaZansky, 1980, p. 610)

To perform the experiment adequately, the science student cannot take liberties, lest he or she err in the performance. Unfortunately, readers

with tendencies toward being too reader based do not know *that* or *what* they do not know. They presume they know the material better than they actually do or need to. Particularly when the text deals with a familiar topic, readers assume that they know what is written. As a result, they often fail to recognize what might be subtle but important text signals. They fail to monitor their interactions with a text. In the context of many classrooms, these students escape identification for they might be successful readers in most situations and be able to "bluff their way through" most teacher questions.

What can a teacher do to help such students? First and foremost, teachers should alert students to the need to monitor their reading differently for different texts. In situations where a more text-based understanding is required teachers might (1) alert the students to the need to read the material carefully, (2) provide adjuncts (inserted questions or activities) which encourage students to monitor their developing interpretation, (3) provide students with strategies such as outlining and note taking for carefully reading the text, (4) encourage students to consciously consider their purposes, their level of understanding, and ways to monitor that understanding, and (5) have the students read the material in conjunction with carrying out some relevant activity (for example, have them complete an experiment which cannot be performed successfully without reading the instructions very carefully).

Alternatively, consider the situation when a reader's understanding is too "text based" for the text and purposes for reading. Spiro (1977) has suggested that certain conditions of schooling may predispose a reader to ascribe to text an autonomy, and authority, which results in the separation of textual information from related prior knowledge. Such students perceive the task of reading as detached from their own experiences. For example, in oral reading situations, in completing cloze activities (especially cloze activities demanding an exact-word replacement), and in response to a teacher's demand for a "more literal" interpretation, we would expect that students may misconstrue what reading comprehension is. They may decide, erroneously, that reading means a word-perfect rendition of a text.

What can teachers do in these situations? First, they should encourage readers to relate their background of experience to what they read and alert them to the importance of their own ideas, perspective, and purpose in any communication. At a minimum, readers should be asked to discuss their knowledge, including their perspective about a topic, in conjunction with a discussion of the author's perspective and what the author assumed the reader knew and might learn. In addition, the teacher can develop appropriate activities or sets of questions which encourage readers to engage their own background of experience prior to, during, and after reading. Questions might encourage them to discuss their perceptions of what might happen and, at various points during reading, what has occurred and any implications of those occurrences.

To illustrate more specifically how this might proceed, here is a technique we have found useful. Begin by asking students what they think of when they hear the word X (where X is the topic that they are going to read about later). As they offer their associations, jot them down into categories (as yet unlabelled categories). For example, for "tree" the implicit categories might include parts of trees, kinds of trees, processes, and products. Go back and help the students label the categories, and then ask them to read the chapter to learn more about X. After the students have read the chapter, return to the set of categories related to X and ask students to add new terms that they have acquired from reading. This activity will give the teacher a vivid demonstration of the students' pre-existing schema, new learnings from the text, and the relationship between new and old information. The technique also maximizes the likelihood of schema engagement during reading.

Postreading Comprehension and Learning: Is the reader's understanding adequate? Are new learnings transferable?

Our fourth guideline moves us from guidance and monitoring of text interactions to addressing the adequacy of readers' understandings. Central to our discussion are, first, the notion that what is considered accuracy of understanding should be regarded as relative and, second, the issue of transfer of new learnings.

The notion that accuracy of understanding should be regarded as relative derives from a recognition that comprehension is doomed to be idiosyncratic. That is, accuracy and appropriateness of understanding should be considered a function of individual reader and individual text characteristics, as well as individual purposes of reading. In constructing an interpretation, a reader selects, inserts, substitutes, deletes, and connects ideas in conjunction with what he or she perceives as "making sense." And what "makes sense" depends upon the text as well as the reader's purposes and background knowledge. Two postulates taken from Tierney and Spiro (1979) are relevant to this notion:

1. A reader's selections, insertions, substitutions, omissions, and binding of ideas are *not* necessarily a sign of reader error.
2. It should not be assumed that each text has a single interpretation.

What implications does this notion hold for teachers? Teachers need to respect both authorship and readership. Indeed, accuracy of understanding is misleading unless it is defined in terms of both the author's intentions and the reader's purposes. This means that teachers must recognize the reader's right to interpret a text at the same time that they instill in students a responsibility to address the author's intentions in writing the text. Curriculum objectives which capitalize upon this perspective should include goals similar to the following: "The student is able to make judgments about his or her own understanding, the author's intentions, task demands, and strategy utilization." Such a goal would include objectives directed at having the student (1) recognize alternative perspectives, (2) engage his or her own background knowledge, (3) consider the plausibility of alternative interpretations, (4) develop strategies for learning from various texts for alternative purposes, (5) understand the nature of task demands (including author's intention and plan of organization), and (6) understand the nature and applications of new learnings.

In assessing the quality of a reader's interpretation, the teacher must ask

> To what extent was the reader's understanding adequate for the text and purposes for reading?
>
> When a reader's understanding diverges from the author's apparent intention, can the reader's interpretation be justified?

Current practices, with their emphasis on correct answers and a single appropriate interpretation, violate these principles. Teachers need to move away from these practices and generate devices which are open-ended and allow for divergent responses. For example, after reading a selection, teachers might allow students to relate their own interpretations prior to prodding them with an array of questions. To move students away from "the right answer" orientation, the teacher might ask them to rank the plausibility of each response to a multiple-choice question. In follow-up discussions different students can compare the rationales behind their various rankings. The acid test for student response quality should be "Can it be justified?" rather than "Is it right?" This criterion places the emphasis precisely where it should be placed: on the quality of the student's reasoning abilities. Such a stance will also increase the likelihood that important rather than trivial aspects of text will receive emphasis.

Consider next the notion of transfer, which relates to whether a reader can apply what he or she has read or learned to other situations. Two questions are important here:

> Is the reader able to recognize new learnings and potential application?
>
> Is the reader able to apply skills acquired during instruction to other text situations without the support of such instruction?

The issue of applying or using new knowledge places reading in a real-world context. The criterion assumes that students understand, remember, and evaluate new information more readily when they know its relevance to other experiences. That is, students should be asked to consider "the point" of what they have read, whether they have read for enjoyment, to gain information, or to solve problems.

The issue of applying learned strategies gets at the heart of instruction. Presumably we teach so that students will become independent learners, no longer needing our intervention and support. Independence is the essence of transfer. Unfortunately, very few studies have addressed

the transfer-of-strategy issue. From those few studies which have been reported, we are impressed that students rarely develop an ability to transfer or apply knowledge, skills, or strategies spontaneously — that is, when they are left to their own resources. Instead, they need to be guided toward transfer. This would include being alerted to *when* and *how* to use *what* strategies.

If teachers are to help students develop independent reading and learning skills, they should not assume that it will just happen. Teachers must design situations and activities in which students can try, discuss, and evaluate strategies, skills, and knowledge utilization across a variety of reading situations. There appear to be some general guidelines emerging from recent research on teaching reading comprehension which are relevant to the goal of helping students learn how to learn. One rather consistent finding is that students rarely acquire transferable abilities without being provided ample opportunities to develop and practice those abilities in a variety of *relevant* contexts.

If teachers are to help students develop independent reading and learning skills, they should not assume that it will just happen. Teachers must design situations and activities in which students can try, discuss, and evaluate strategies, skills, and knowledge utilization across a variety of reading situations. There appear to be some general guidelines emerging from recent research on teaching reading comprehension which are relevant to the goal of helping students learn how to learn.

Students need to understand the purpose and function of reading strategies, comprehension, or learning as well as be given appropriate situations within which to explore their nature. Furthermore, if a reader is being asked to apply a strategy determining the main idea, the reader should do so within a variety of situations for which it is reasonable to find the main idea. Students should be given feedback on their efforts and opportunities to test their skills independent of teacher support. Student independence implies systematically phasing out teacher dependence, which, in turn, implies that students will be given learning experiences where they are given an explicit understanding of when, why, how, and what to do.

Concluding Remarks

It has been the purpose of this paper to draw upon recent developments in the study of reading comprehension as a means of examining issues of relevance to improving reading comprehension and learning from text. We have suggested that if teachers are to develop a reader's understanding, they should address the adequacy of their pedagogy against some basic notions about reading and learning. The notions that we have suggested are driven by a schema-theoretic perspective — a view which prompted the following questions as guidelines to instructional decision making.

- Did the reader have the relevant schemata for a text?
- Was the reader's schema activated (purpose, background knowledge, attention, focus, interest) prior to, during, and after reading? Was the reader's relevant background of experience activated during reading?
- Across reading material for different purposes did the reader exhibit flexible processes in terms of activating, focusing, maintaining, and refining an interpretation? Was the reader aware of the strategies one could use to cope with different texts and purposes for reading?
- To what extent was the reader's understanding adequate for the text and purposes for reading? When a reader's understanding diverges from the author's intention, did the reader justify his or her interpretation? Did the reader recognize his or her perspective and the perspective of others?
- Was the reader aware of his or her level of understanding of a text read for different purposes?
- Did the reader recognize new learnings and their potential applications?

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Direct Instruction Reconsidered*

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Editors' Note: *Penelope Peterson reports on her meta-analysis of forty-five studies which compared student outcomes from more directive and less directive approaches to basic skills instruction. Meta-analysis is a relatively new and promising approach to summarizing findings from many research reports. After a brief discussion of previous summaries, issues, and the different methods of summarizing, the author discusses her findings on twelve different cognitive and affective instructional outcomes. She finds that each instructional approach leads to somewhat better results for different outcomes and that some students do better in one or the other situation. Her findings, consistent with those of Resnick and of the participants in the basic skills synthesis meeting discussed in the foreword, further contribute to the case for a richer mix of more and less directive approaches.*

Two decades ago, Richard Anderson reviewed the research studies comparing two basic teaching styles: teacher-centered (directive) and learner-centered (nondirective). In a summary of his research he reported that, of thirty-two studies reviewed, eleven indicated greater learning when learner-centered methods were used, eight indicated greater learning when teacher-centered methods were used, and thirteen indicated that learning was the same regardless of the method used. He concluded:

> Much of the research on teaching methods in the last twenty years seems bent on discovering whether "The meek shall inherit the earth," or whether, on the other hand, "Nice guys lose." ... Teacher-centered and learner-centered methods have been repetitiously investigated not because they were well conceived ideas as to *how* one would lead to superior learning, but merely to find out *if* one style was superior to the other. We were not fortunate enough to find that one method is consistently better than or even consistently different from the other; thus, we are now forced to explore new avenues.[1]

Now, nearly twenty years after Anderson's review, we seem to be traversing the same old avenue again, only this time the teacher-centered or directive method is called "direct instruction" and the other method is referred to as an "open," "indirect," or "nontraditional" approach.[2] Also, this time there appear to be some well-conceived ideas as to *how* direct instruction will lead to superior learning. As Barak Rosenshine points out,[3] researchers have moved from a primary concern with teacher behaviors — a concern that began in 1958 with the work of Ned Flanders and Donald Medley — to a focus on student attention or engagement and content covered or "opportunity to learn." Student attention, student engagement, and content covered seem to be increased by certain teaching activities and settings that Rosenshine terms "direct instruction." According to

*From *Research on Teaching: Concepts, Findings, and Implications*, by Penelope L. Peterson and Herbert J. Walberg et al. Berkeley, McCutchan Publishing Corporation, © 1979. Permission granted by the publisher.

Rosenshine, direct instruction has the following dimensions: an academic focus, a teacher-centered focus, little student choice of activity, use of large groups rather than small groups for instruction, and use of factual questions and controlled practice in instruction.

Recent reviews of research on teaching strongly suggest that direct instruction is the most effective way of teaching.[4] The reviews consider only several of the many studies comparing open and traditional teaching, however, and a closer and more exhaustive survey of the literature suggests that such a conclusion may be simplistic. Direct instruction may be effective for attaining some educational outcomes or objectives, but not for attaining others. Also, direct instruction may be effective for some kinds of students, but not for others. Although Rosenshine has alluded to the idea that different teaching approaches may be effective for different ends and for different types of students, he leaves the reader with the overriding impression that direct instruction is best.[5]

This chapter reviews the research on the effectiveness of direct instruction and related teaching variables. The intent is not to answer whether direct instruction is more effective than more indirect or open ways of teaching. Rather, it is to address other questions: For what educational outcomes is direct instruction most effective and for what kinds of students? For what educational outcomes are indirect or open ways of teaching most effective and for what kinds of students? I review studies that compare direct instruction with more indirect, open, or non-traditional approaches and consider various cognitive outcomes of instruction as well as various affective outcomes. I also discuss the effect of student characteristics on outcomes from both approaches. Most of the research reviewed here was conducted at the elementary school level, but some studies were conducted at the middle school or junior high school levels.

Comparisons of Direct and Open Instruction

In a recent review, Robert Horwitz located nearly two hundred studies that compared educational outcomes of open-classroom teaching with traditional teaching.[6] In these studies, open-classroom teaching was generally referred to as "a style of teaching involving flexibility of space, student choice of activity, richness of learning materials, integration of curriculum areas, and more individual or small-group than large-group instruction."[7] This open style was compared with traditional teaching. Although traditional teaching may not be completely synonymous with "direct instruction" as described by Rosenshine, it is clear that traditional teaching is more direct than open teaching. Furthermore, the characteristics of open teaching described above are the opposite of the characteristics of direct instruction given by Rosenshine.

Horwitz used a "box score" or "voting method" to integrate findings across research studies. For each study he simply tallied whether the results favored open teaching, traditional teaching, or indicated no significant differences. If the results were ambiguous, he counted the study as showing mixed results. After all studies had been reviewed, he tallied the number of studies falling into each of the four categories and then attempted to draw conclusions from the box score results. Typically, the procedure for drawing conclusions from box score results is as follows: If there is a plurality of studies in any one of the categories with fewer studies in other categories, then the category with the plurality is declared the winner. It is assumed that the winning category will provide the best estimate of the direction of the true relationship between the independent and the dependent variable — in this case, the teaching approach and the educational outcome.

One major problem with Horwitz's procedure is that, by basing the tally on the statistical significance of the results rather than on the direction of the results regardless of statistical significance, Horwitz maximized the risk of Type II errors. Gage has suggested that, in view of the small sample sizes in most studies of teaching, "it seems evident that most of the single studies should not be expected to yield statistically significant results."[9] Thus, by relying on statistical significance, Horwitz increased the probability of concluding that no difference existed between direct and open instructional approaches when, in fact, a true difference may have existed.

A second problem with Horwitz's procedure is a deficiency of the box score or voting method in general. The box score or voting method ignores good descriptive information in the studies. As Glass has pointed out: "To know that televised instruction beats traditional classroom instruction in 25 to 30 studies — if, in fact, it does — is not to know whether TV wins by a nose or in a walkaway."[10] Thus, Glass recommends calculating the strength of the experimental effect in each study because it gives the reader an indication of the importance of the relationship rather than just the significance or the nonsignificance. He suggests using "effect size" as a measure of the strength or importance of an effect. Effect size is calculated by subtracting the mean on the outcome variable in the control group from the mean on the same variable in the experimental group and dividing the result by the standard deviation of the control group.[11] This gives an indication of the size of the difference in effect between the two groups in terms of the standard deviation. Effect sizes can then be averaged across studies, and one can determine whether a particular approach makes a greater difference (for example, one standard deviation or more) or much less difference (for example, .5 standard deviation or less).

I attempted to calculate effect size for the studies located by Horwitz and for several additional studies that I found. I reviewed only those studies that compared educational outcomes for open approaches and traditional approaches. Effect size was calculated by subtracting the mean on the outcome in the traditional approach and dividing the result by the standard deviation of the traditional approach. Thus, positive effect sizes were those that favored the open approach, and negative effect sizes were those that favored the traditional approach.

Unfortunately, most of the studies did not contain enough information to permit calculating effect size. Many of the studies were unpublished dissertations, and the dissertation abstracts contained insufficient information. Since the review does not include many unpublished studies, one can only speculate how the results would differ if all unpublished studies were included. In a comparison of the results of published studies and unpublished studies in the field of psychotherapy, Glass reported that published studies showed a slightly larger effect size than unpublished studies: "studies published in books showed an average effect size of $.8\sigma_x$; studies from journals had a mean effect size of $.7\sigma_x$; thesis studies averaged $.6\sigma_x$; and unpublished studies averaged $.5\sigma_x$."[12] One might infer from the above results that, if dissertations and other unpublished studies were included in the present review, the average effect size across studies may be slightly reduced.

A total of forty-five studies did, however, contain sufficient information to permit calculating effect size. After reviewing all of the studies, I calculated the mean and median effect sizes across those studies for twelve different educational outcomes. These results and the results of Horwitz's review are presented in Table 1. In the remainder of the chapter, I discuss the results according to the type of educational outcome measured.

Cognitive Outcomes

Cognitive outcomes included composite achievement, achievement in mathematics, achievement in reading, creativity, and problem solving. Horwitz reviewed 102 studies that investigated composite achievement on standardized tests and found that the plurality of studies indicated no significant difference between open and traditional approaches. When effect sizes were calculated for twenty-five of these studies, they were found to average $-.12$, with the lowest effect size being $-.78$ and the highest effect size being .41. Effect sizes were also calculated for studies that provided separate data on achievement in mathematics and reading. The average and range of effect size for reading achievement were similar to those for composite achievement. The data on effect size suggest that, although on the average students tended to achieve more with traditional teaching than with open-classroom teaching, the average effect size was quite small. The difference between the two approaches in terms of students' achievement was about one-tenth of a standard deviation.

As for creativity, however, the results indicate that students in open approaches tend to be more creative than those in traditional approaches. Creativity was typically assessed with

Table 1
Summary of studies comparing open and traditional teaching approaches

Educational outcomes	Peterson review				Horwitz review*				
	Number of studies	Size of effect†			Number of studies	Percentage of studies showing —			
		Mean	Median	Range		Open is better	Traditional is better	Mixed results	No difference
Cognitive									
Achievement-composite	25	−.12	−.20	−.78 to + .41	102	14	12	28	46
Achievement-mathematics	18	−.14	−.04	−1.01 to + .58	—	—	—	—	—
Achievement-reading	20	−.13	−.22	−.72 to + .44	—	—	—	—	—
Creativity	11	.18	.32	−.23 to + .50	33	36	0	30	33
Problem solving	1	.98	.98	—	—	—	—	—	—
Affective									
Self-concept	14	.16	.16	−.14 to +1.45	61	25	3	25	47
Attitude toward school	15	.12	.21	−.43 to + .48	57	40	4	25	32
Attitude toward teacher	2	.42	.42	.29 to + .56	—	—	—	—	—
Curiosity	3	.14	.08	−.17 to + .52	14	43	0	36	21
Locus of control	5	.03	−.14	−.34 to + .70	24	25	4	17	54
Anxiety	5	.07	.41	−.63 to + .69	17	18	29	6	47
Independence	3	.30	.29	+.07 to + .55	23	78	4	9	9

*From Robert A. Horwitz, "Effects of the 'Open Classroom,'" *Educational Environments and Effects: Evaluation, Policy, and Productivity*, ed. Herbert J. Walberg (Berkeley, Calif.: McCutchan Publishing Corporation, 1979), chap. 14.
†A positive effect size favors the open approach; a negative effect size favors the traditional approach.

paper-and-pencil tests, and answers were scored for fluency, flexibility, originality, and elaboration. Horwitz found that in a plurality of studies (36 percent), creativity was higher in open approaches than in traditional ones. I found that the average effect size for creativity was .18. In other words, students in open approaches had creativity scores that were, on the average, a fifth of a standard deviation higher than the creativity scores of students in traditional classrooms. In an additional study, which looked at students' ability to solve problems as measured by Raven's Progressive Matrices, it was found that students in open approaches scored approximately one standard deviation higher than students in more traditional approaches. This finding should, however, be regarded as tentative since it is based on only one study.

When taken together, the findings for cognitive outcomes of teaching suggest that the effects of open and more direct or traditional approaches do depend on the type of cognitive outcome. Although the effects in all cases are quite small, they suggest that, with traditional teaching, students tend to perform slightly better on achievement tests, but they do worse on tests of more abstract thinking, such as creativity and problem solving. Conversely, with open teaching, students may perform worse on achievement tests, but they tend to do better when it is necessary to be creative and to solve problems.

Affective Outcomes

Affective outcomes included self-concept, attitude toward school, attitude toward teacher,

curiosity, locus of control, anxiety, and independence. Self-concept, attitude, locus of control, and anxiety were assessed using self-report, paper-and-pencil measures. In some cases, curiosity and independence were assessed with paper-and-pencil measures and in other cases behavioral ratings were used.

The clearest differences between open and traditional approaches appeared for attitude toward school, attitude toward teacher, independence, and curiosity. Horwitz reviewed fifty-seven studies that investigated attitude toward school and found that a plurality (40 percent) favored open instruction. I found that the average effect size for attitude toward school was small — only about .12. A stronger effect appeared for attitude toward teacher. Although only two studies were reviewed, the average effect size was .42. Horwitz found that of twenty-three studies that investigated independence, the vast majority (78 percent) favored the open approach. In other words, students where open approaches were used were more independent than students where traditional approaches were used. The average effect size for three studies was .30, or approximately one-third of a standard deviation. When curiosity was the educational outcome, Horwitz again found that the plurality of studies (43 percent) favored open approaches. Students were more curious in open approaches than in traditional approaches. The average effect size was .14 across three studies.

The clearest differences between open and traditional approaches appeared for attitude toward school, attitude toward teacher, independence, and curiosity.

The research on self-concept, locus of control, and anxiety indicated little difference on these outcomes between open and traditional approaches. On all three outcomes, Horwitz found that the plurality of the studies showed no significant difference between the approaches. For locus of control and anxiety, the average effect size approached zero. The average effect size was larger for self-concept (.16), but was still small.

What the research suggests, therefore, is that open approaches surpass traditional ones in improving students' attitude toward school and toward their teacher and in promoting students' independence and curiosity, but the size of the effect is small. On the other hand, the research on self-concept, locus of control, and anxiety indicates that there is little or no difference between open and traditional approaches on these affective outcomes.

The Effect of Student Characteristics

Seven studies investigated the effect of student characteristics on educational outcome in open and traditional approaches. The results of these studies suggest that the effectiveness of the approach depends on the type of student being taught.

Several studies examined the effect of students' ability on achievement and creativity in open and traditional approaches. Ward and Barcher found that, although the achievement of low-ability students did not differ in open and traditional approaches, the achievement of high-ability students was significantly greater in traditional approaches than in open approaches.[13] Similarly, Bennett found that students with high prior achievement achieved more in traditional approaches than in open approaches, but boys who had low prior achievement did better in open than in traditional approaches.[14] In contrast, Grapko reported that high-ability students did not differ in achievement in open and traditional approaches, but low-ability students did significantly better in traditional approaches.[15] Similarly, Solomon and Kendall found that low-ability students achieved more in traditional approaches. They also found that the achievement of high-ability students depended on their level of compliance or conformity. High-ability students who were low on conformity did better in traditional approaches than in open ones. High-ability students who were moderate or high in their levels of conformity achieved more in open than in traditional approaches.[16]

When creativity was the educational outcome, Ward and Barcher reported that low-abil-

ity students did not differ in their creativity in open and traditional classes, but high-ability students were significantly more creative in traditional classes than in open classes.[17] In contrast, Solomon and Kendall found that low-ability students were more creative in traditional approaches, and high-ability students were more creative in open approaches.[18]

The remaining studies examined the effect of student personality and motivation on achievement and attitude in open and traditional approaches. Bennett found that motivated, sociable students who had positive self-concepts achieved more in traditional approaches than in open approaches. Unmotivated, unsociable, nonconforming students who had negative self-concepts achieved more in approaches that were a combination of open and traditional.[19] Papay and his colleagues investigated students' trait anxiety and found that low-anxious students performed better on a mathematics test where a traditional teaching approach was used than where an open approach was used; high-anxious students performed better where an open approach was used than where a traditional approach was used.[20]

Two studies investigated the effect of locus of control on outcomes in open and traditional approaches and reported similar findings. The results reported in the previous section indicated that, when locus of control was considered as an outcome, students in open and traditional approaches did not differ on locus of control. But Wright and DuCette found that students who had an internal locus of control (that is, when they felt that they had personal control over their successes and failures) achieved more in open approaches than in traditional ones. Students who had an external locus of control (that is, when they felt that their successes and failures were due to fate, luck, or other forces outside their control) achieved as well in traditional as in open approaches.[21] Arlin reported similar findings when attitude toward school and attitude toward teacher were the educational outcomes. Internals had more positive attitudes in an open approach than in a traditional approach; externals did not differ in their attitudes in open and traditional approaches.[22] These findings can be explained in terms of the type of student one would expect to do well in an open approach. Since an open approach typically encourages students to take more responsibility for their own learning than a traditional approach, one would expect that a student who has an internal locus of control would be particularly suited to an open approach.

In sum, the findings are inconsistent as to the effect of students' ability on achievement and creativity in open and traditional approaches, and no definitive conclusions can be drawn. But the findings on students' locus of control are provocative and suggest that the effectiveness of the open approach in promoting student achievement and attitude may depend on the individual student's own sense of personal control over his or her actions.

Implications

Rosenshine admits that the picture of direct instruction seems grim: "large groups, decision making by the teacher, limited choice of materials and activities by students, orderliness, factual questions, limited exploration of ideas, drill, and high percentages of correct answers."[23] To me, the picture of direct instruction seems not only grim but unidimensional as well. It assumes that the only important educational objective is to increase measurable student achievement and that all students learn in the same way and thus should be taught in the same way. Yet most educators agree that a broad range of educational goals is important, including increasing students' creativity, independence, curiosity, self-concept, and attitude toward school and learning. Furthermore, a recent survey indicates that taxpayers support a wide variety of social and humanistic goals — not just the so-called basics — for public education and are willing to support higher taxes to help meet these goals.[24]

In this review of the research, we have seen that, although a more direct or traditional teaching approach may be slightly better, on the average, than an open approach for increasing students' achievement, an open approach appears to be better than a more direct approach for increasing students' creativity, independence, curiosity, and favorable attitudes toward school and learning. In addition, the research suggests

that some kinds of students may do better in an open approach and others may do better in a more direct approach. The implication is that, if educators want to achieve a wide range of educational objectives and if they want to meet the needs of all students, then neither direct instruction alone nor open-classroom teaching alone is sufficient.

Educators should provide opportunities for students to be exposed to both teaching approaches. One solution would be to reserve part of the school day for direct instruction in reading and mathematics and the remainder of the school day for a more open approach to learning.[25] Another solution now being used in some school districts is to allow parents to select the type of school and classroom best suited to their child's needs for a particular school year. Some students might need a more open approach to become interested in reading while others might need a more structured approach to learn reading. Some students might not need to improve their reading skills, but, rather, they may need to learn to be more independent and curious. The picture thus becomes multidimensional — children learning the basic skills but also learning to be happy, creative, curious, and independent persons in the way they learn best.

Notes

1. Richard C. Anderson, "Learning in Discussions: A Resume of the Authoritarian-Democratic Studies," *Harvard Educational Review* 29 (1959): 201-215, esp. 211-212.
2. See Barak Rosenshine, in *Research on Teaching: Concepts, Findings, and Implications*, eds. Penelope L. Peterson and Herbert J. Walberg (Berkeley, Calif.: McCutchan Publishing Corporation, 1979), chap. 2.
3. Ibid.
4. See, for example, Barak V. Rosenshine, "Classroom Instruction," in *The Psychology of Teaching Methods*, Seventy-fifth Yearbook of the National Society for the Study of Education, Part I, ed. N.L. Gage (Chicago: University of Chicago Press, 1976), 335-371; see also Rosenshine, in *Research on Teaching*, chap. 2; and N.L. Gage, *The Scientific Basis of the Art of Teaching* (New York: Teachers College Press, 1978), 31-35.
5. See Rosenshine, in *Research on Teaching*, chap. 2; and Barak V. Rosenshine, "Review of *Teaching Styles and Pupil Progress* by Neville Bennett," *American Educational Research Journal* 15 (1978): 163-169.
6. Robert A. Horwitz, "Effects of the 'Open Classroom,' " in *Educational Environments and Effects: Evaluation, Policy, and Productivity*, ed. Herbert J. Walberg (Berkeley, Calif.: McCutchan Publishing Corporation, 1979), chap. 14.
7. *Ibid.*, 7.
8. Richard J. Light and Paul V. Smith, "Accumulating Evidence: Procedures for Resolving Contradictions among Different Research Studies," *Harvard Educational Review* 4 (1971): 429-471.
9. Gage, *The Scientific Basis of the Art of Teaching*, 27.
10. Gene V Glass, "Integrating Findings: The Meta-analysis of Research," in *Review of Research in Education*, Volume V, ed. Lee S. Shulman (Itasca, Ill.: F.E. Peacock Publishers, 1977), 359.
11. *Ibid.*, 366.
12. Gene V Glass, "Primary, Secondary, and Meta-analysis of Research," presidential address presented at the meeting of the American Educational Research Association, San Francisco, April 1976, p. 42.
13. William D. Ward and Peter R. Barcher, "Reading Achievement and Creativity as Related to Open Classroom Experience," *Journal of Educational Psychology* 67 (1975): 683-691.
14. Neville Bennett, *Teaching Styles and Pupil Progress* (Cambridge, Mass.: Harvard University Press, 1976), 80-97.
15. Michael P. Grapko, *A Comparison of Open Space and Traditional Classroom Structures According to Independence Measures in Children, Teachers' Awareness of Children's Personality Variables, and Children's Academic Progress*, Final Report (Toronto: Ontario Department of Education, 1972). ERIC: ED 088 180.
16. Daniel Solomon and Arthur J. Kendall, "Individual Characteristics and Children's Performance in 'Open' and 'Traditional' Classroom Settings," *Journal of Educational Psychology* 68 (1976): 613-625.
17. Ward and Barcher, "Reading Achievement and Creativity as Related to Open Classroom Experience."
18. Solomon and Kendall, "Individual Characteristics and Children's Performance in 'Open' and 'Traditional' Classroom Settings."
19. Bennett, *Teaching Styles and Pupil Progress*, 132-140.

20. James P. Papay *et al.*, "Effects of Trait and State Anxiety on the Performance of Elementary School Children in Traditional and Multiage Classrooms," *Journal of Educational Psychology* 67 (1975): 840-846.

21. Robert J. Wright and Joseph P. DuCette, *Locus of Control and Academic Achievement in Traditional and Non-Traditional Educational Settings*, Unpub. MS, Beaver College, Glenside, Pa., 1976. ERIC: ED 123 203.

22. Marshall Arlin, "The Interaction of Locus of Control, Classroom Structure, and Pupil Satisfaction," *Psychology in the Schools* 12 (1975): 279-286.

23. See Rosenshine, in *Research on Teaching*, chap. 2.

24. Jeff Browne, "Poll Finds Public Prefers Broad Education Goals," *Milwaukee Journal*, July 23, 1978, p. 9.

25. Rosenshine, "Review of *Teaching Styles and Pupil Progress* by Neville Bennett."